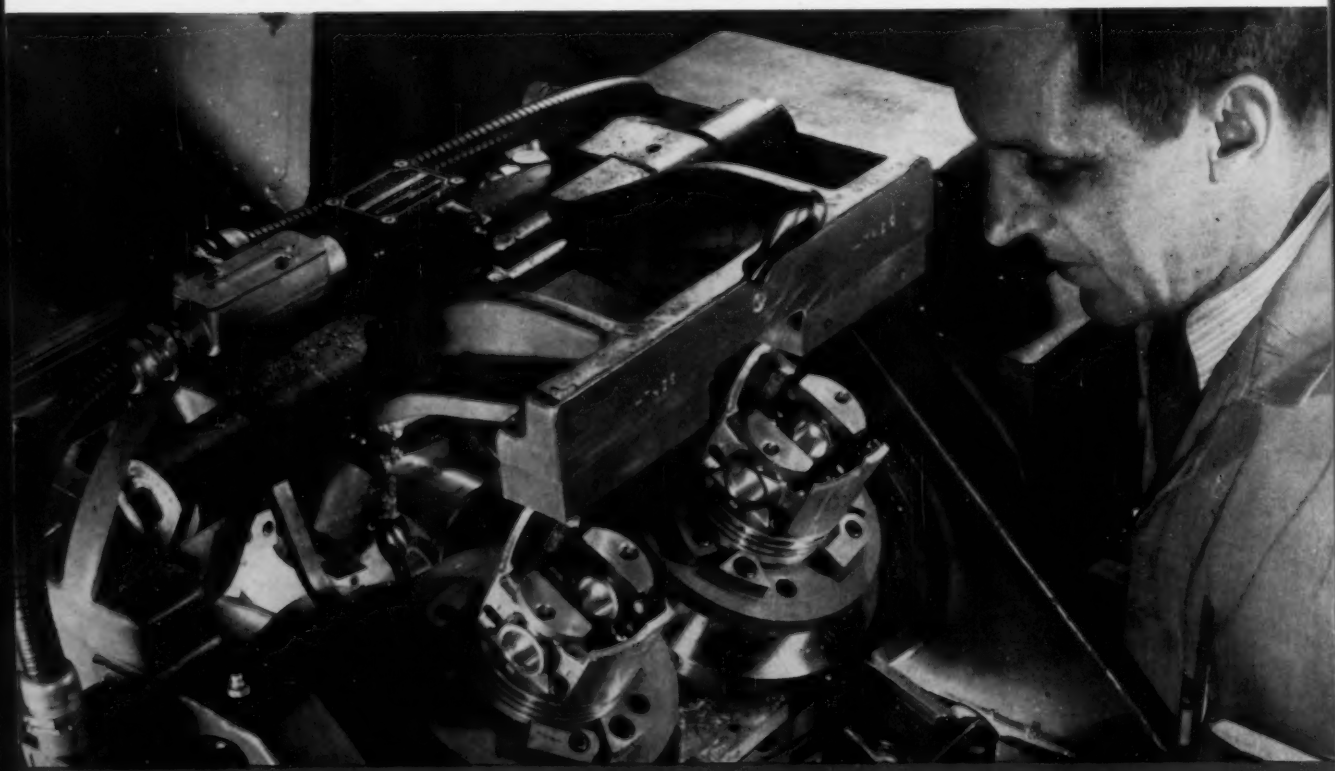
December 6, 1956

The IRON AGE

The National Metalworking Weekly



How Automatic Loaders Lift Job Profits P.123

The Growing Pressure On Steel Prices P. 83
Small Business: How To Get U. S. Contracts P. 88
Digest of the Week P – 2


WE'RE IN THERE PITCHING!
The Copperweld trade mark is the symbol of the finest steels you can buy. There is reason for this. Copperweld specializes in electric furnace steels. More rigid metallurgical controls, from laboratory analyses to the scientific addition of alloys when electric furnaces are tapped, make higher quality possible. The constant scientific study and checking of minute details by skilled metallurgists insure high quality blooms, bars and billets of alloy or carbon steels, either leaded or unleaded.
ARISTOLOY STEELS
COPPERWELD STEEL COMPANY • Steel Division • Warren, Ohio
EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.



Thousands of Bethlehem High-Strength Bolts were used to join structural members in framework for new Prudential office building in Jacksonville, Fla. *Architects:* Kemp, Bunch and Jackson. *Contractor:* Daniel Construction Company of Alabama. *Fabricator and Erector:* Ingalls Iron Works Company.

High-Strength Bolting Speeded Erection of New Office Building in Jacksonville

This handsome building encased in marble, limestone and pink granite is the South-Central headquarters of The Prudential Insurance Company of America, at Jacksonville, Fla. The 22-story structure has a steel framework of 5,893 tons, held together with thousands of Bethlehem High-Strength Bolts. This method of construction saved erection time, as the bolting was completed within a week after the last piece of steel was set.

High-strength bolting is rapidly increasing in popularity as a means of erecting steelwork economically. Bolted joints are made rapidly. The bolts, used with hardened washers, can be installed in seconds. A holding wrench grasps the bolt-head, and the nut is driven to predetermined tension with a calibrated pneumatic impact wrench. That's all there is to it! There's no fire hazard involved. Besides, the bolting operation is less noisy than riveting, making it more suitable for use in hospital and school zones.

Bethlehem High-Strength Bolts are made of carbon steel, and come in sizes to meet virtually every construction need. They are heat-treated by quenching and tempering, and meet every requirement of ASTM Specification A-325.

You'll find the nearest Bethlehem sales office glad to assist in answering your questions about high-strength bolting. Why not give them a call right now? Or drop a line to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

DIGEST OF THE WEEK IN METALWORKING

Dec. 6, 1956—Vol. 178, No. 23

The IRON AGE

Digest of the Week in Metalworking

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Copyright 1956, by Chilton Co.

THE IRON AGE, published every Thursday by CHILTON CO., Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only, or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $15; other Foreign Countries, $25 per year. Single copies, 50¢. Annual Review Issue, $2.00. Cables: "Ironage," N. Y.

Address mail to The IRON AGE
Chestnut and 56th Sts. Philadelphia 39, Pa.

NEWS DEVELOPMENTS

COSTS PROD MILLS TOWARD STEEL PRICE HIKE P. 83

Rising material costs, runaway scrap costs are putting pressure on. Ex-



pected cost-of-living wage boost Jan. 1 could be added spur. If base prices hold, extras are seen going up $3 a ton average.

REVOLT OVER DUES INCREASE ROCKS STEELWORKERS UNION P. 85

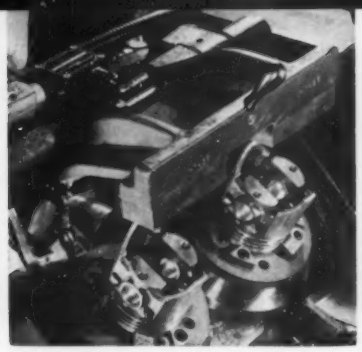
Unhappiness over the dues hike reflects intra-union opposition to McDonald. Leaders, not disturbed about dissenters succeeding, see move as part of a long-range campaign.

WHAT HAPPENED TO DETROIT IN 1956? P. 86

Sales and production snafus hurt the auto firms this year. As a result steel and other suppliers suffered. Part of the trouble is seen as overconfidence in the appeal of the 1956 models.

HOW SMALL BUSINESS CAN GET U. S. CONTRACTS P. 88

SBA says small manufacturers miss out on $2 billion a year in government contracts. Conferences around country show businessmen what types of contracts are available.



AUTOMATIC LOADING - UNLOADING position is one of three stations on this Heald Machine Co. Bore-Matic for turning, boring and grooving automotive pistons. Benefits of automatic loading devices for standard machines are detailed in the story beginning on p. 123.

LIQUID OXYGEN PRODUCTION RACE IS ON P. 90

Introduction of lightweight cylinders puts spotlight on liquid oxygen production. Savings in shipping and storage give liquid an inside track to many markets. But gaseous still holds onto big markets. New tank makers expect big business. Two producers set goal of 3000 tanks during 1957.

FEATURE ARTICLES

HOW AUTOMATIC LOADING LIFTS JOB PROFITS P. 123

The use of simple, and relatively inexpensive, automatic loaders for standard machine tools can offer a valuable "middle way" to effective modernization. Reports of their benefits vary, but returns for the most part are encouraging — sometimes surprisingly so. They're one way to hold your competitive position—at a moderate cost.

TUNNEL ANNEALING SPEEDS STAINLESS PARTS PRODUCTION P. 128

A new annealing furnace, heated by radiant burners, is making the in-process annealing of TV tube housings more efficient. Metallurgically sound, the short heating cycle falls into line with continuous assembly methods. Here's an application that can be readily adapted to any number of cold forming operations.

NEW MACHINE SORTS DRY POWDER BY PARTICLE SIZE P. 130

Separating one size particle from another in a dry powder can present problems. However, one new classifier achieves the precise split at 15 tons hourly. Operating continuously, the machine flings particles out from its spinning core, and into an opposed air blast. Light particles go one way, heavier particles another.

HOW TROUBLESHOOTING MAKES BENDING EASIER P. 132

You can troubleshoot your way to better bends by knowing precisely where trouble can strike in the press shop. Here's help in doing it. First, trace causes of poor bends back to the workpiece, tooling or press operation. With that as a starting point, use the listing aids in this article to pinpoint the trouble.

FORWARD STORAGE CONVEYORS CUT SHIPPING COSTS P. 136

Opportunity to build a new plant gave a plumbing supply company carte blanche in setting up a conveyorized forward-storage system. Result: First-in, first-out shipping. Other benefits are increased manhour productivity, greatly eased inventory control, and smooth-flowing operation from assembly lines to shipping dock.

MARKETS AND PRICES

RECONDITIONED DRUMS SAVE MONEY, STEEL P. 87

The steel drum reconditioning industry has grown into a multi-million dollar business in 15 years. By extending drum life to an average of 10 trips, reconditioners are conserving about one million tons of hot-rolled sheet each year. Used drum prices are 25 pct lower than new.

SCREW MACHINE PRODUCT SALES ARE SPIRALING P. 92

Industry has made steady gains since WWII. Shipments in 1956 totaled over half a billion dollars. But high costs spell trouble for some independents. Modernization of existing equipment is important goal for the industry. Electronic inspection is expected to become increasingly important.

AUTOMAKERS' BIGGEST PROBLEM IS COST P. 100

A major concern isn't styling or engineering; it's how to get costs down. With a production of 1.5 million cars, an increase in cost of only 1¢ on one part means $15,000. Rule is to cut costs where it won't show.

NORTHWEST'S POWER BOOM AIDS METALWORKING P. 107

Projects calling for expansion in area's capacity will benefit metals firms in two ways. Fabricators can use the added power supply; construction of plants means more sales for equipment suppliers.

STEEL MARKET BRACES FOR SUEZ IMPACT P. 179

U. S. efforts to help Europe weather the aftermath of Suez will begin to hit home in January. Impact will hit heaviest at already-tight plate and pipe. It will come when domestic industry is running full speed.

NEXT WEEK:

HOW TO PAY EXECUTIVES

The problem of adequate compensation for executives and engineers is getting a lot of attention. One reason is the high turnover rate. Here's latest on what compaines are doing about salaries, bonuses and pensions. (American Management Assn. photo.)



Now! CHANGE SUBMERGED ELECTRODES IN AN HOUR!

. . . without disturbing furnace casing or pot
. . . at substantial savings of labor, material and time



1 Just hoist the removable tile covering . . .

Another AJAX First!



2 Electrodes are now completely accessible for fast changing.

In this unique new Ajax Electric Salt Bath*, electrodes enter the furnace from over the top, *yet retain all the favorable characteristics of the submerged design.* They are replaced by hoisting a removable tile, putting in new ones and setting the tile back in place.

It's as simple as that! No need to disturb either the pot or furnace casing. "Down time" is held to an absolute minimum. Salt is saved. Spare casings are no longer required. A complete electrode change takes about an hour per pair. Often, the change can be accomplished before the molten salt can solidify.

Write for bulletin giving details of this revolutionary design feature for either new or old Ajax Electric Salt Bath Furnaces.

AJAX
HULTGREN
electric SALT BATH furnaces

ALL THE ADVANTAGES OF COMPLETELY SUBMERGED ELECTRODE DESIGN!

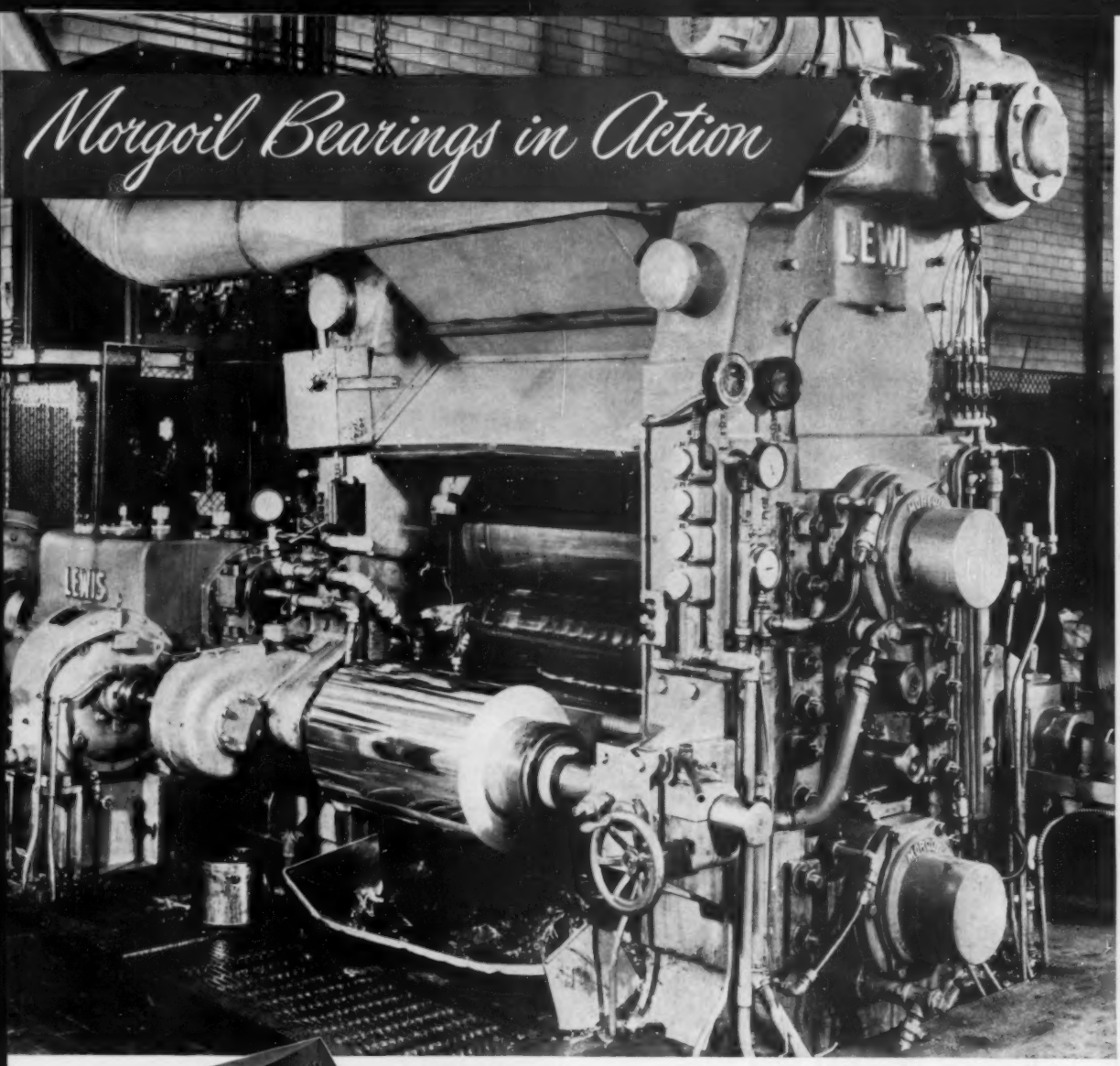
The removable tile covering seals the electrodes against air, thus giving all the advantages of submerged design including protection against oxidation at the salt line. Life of new type Ajax electrodes using no critical materials compares more than favorably with that of conventional nickel alloy electrodes in conventional-electrode furnaces.

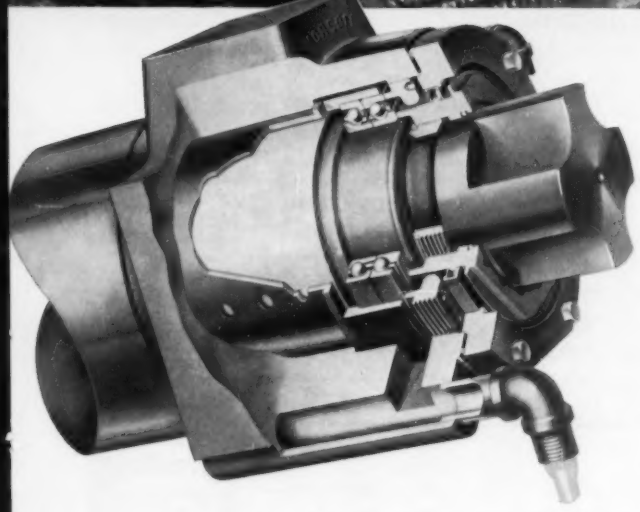
*Patent Pending

AJAX ELECTRIC COMPANY
904 FRANKFORD AVENUE, PHILADELPHIA 23, PA.

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Morgoil Bearings in Action





The 18″-72″ MORGOILS on the 9″ and 21″ x 44″ Aluminum Foil Mill at Cochran Foil Co. pictured above make it easier to produce a quality product at high speed. Foil as thin as .00025 of an inch is rolled at speeds approaching 4000 feet per minute on MORGOIL-equipped mills. MORGOIL BEARINGS give you freedom from wear and fatigue and permit operation at high speeds with remarkable long bearing life.

MORGAN CONSTRUCTION CO.

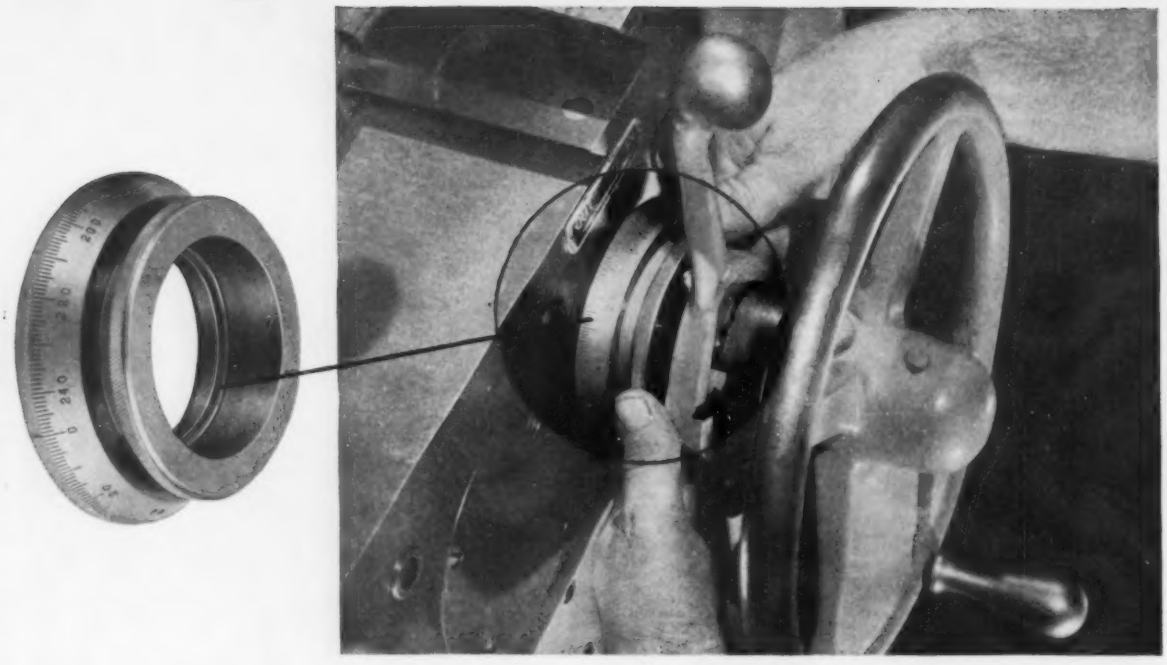
WORCESTER, MASSACHUSETTS

ROLLING MILLS MORGOIL BEARINGS GAS PRODUCERS
WIRE MILLS EJECTORS REGENERATIVE FURNACE CONTROL

MB-31

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"Armco 17-4 PH Stainless Gives us a Better Product at Lower Cost," Machine Tool Builder says

Serrated dials like this are used on many of the machine tools built by a leading manufacturer. They accurately measure all movements on the tools. So they must be hard, resistant to rust and corrosion, and be finished to extremely close tolerances.

17-4 PH Meets Needs at Less Cost

Armco 17-4 PH Stainless Steel was selected for this critical machine tool part because its unusual combination of high strength, hardness and corrosion resistance meets service requirements and its low temperature heat treatment cuts production costs.

This is what a company official said: "We machine dial blanks from Armco 17-4 PH bars, graduate, then heat treat for hardness (875 F for 1 hour). The part is complete with no further operations and has an excellent appearance. 17-4 PH gives us a better end-product at considerably lower cost."

Results like these are typical of the advantages offered by the unusual properties of this special Armco Stainless Steel. It combines exceptionally high strength and hardness with excellent corrosion resistance and low temperature heat treatment that causes no scaling or distortion.

How About Your Products?

Consider how these advantages of Armco 17-4 PH can improve your products or cut production costs. It is available in the form of bars, wire and billets. A companion grade, Armco 17-7 PH, is supplied in sheets, strip, plates, bars and wire.

For complete information on these special Armco Stainless Steels, fill out and mail the coupon today.

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Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

EDITORIAL

Easy Solutions Are For The Birds!

◆ IF YOU BELIEVE things will quiet down for a spell in 1957, you had better throw in the sponge now. It isn't in the cards. That's one reason why you must play part of your business judgments by ear; some of the old rules don't work.

One thing you can be sure of. There will be plenty of competition amidst a record boom plateau. What you planned a few months ago may be out of the question now because of the Suez eruption. What you plan now may be counted out later.

Even so, this has been the lot of most business people for many years. Maybe you have become numbed to the fact that we face other upheavals. If that's the case, get someone to restore the circulation to the gray-matter area.

Now you must decide if you can afford to embark on that sweet-sounding inventory liquidating jaunt. Don't count the hard cash until you are sure you can replace some of the stuff you hope to dispose of. It might not be around later.

If you figured your government could—or would—wash its hands of the "mess" away from our shores, you are wrong. Billions will be added to foreign aid because it must be done. That will make some things like oil, steel, cotton and strategic minerals harder to get in 1957 than your earlier plans called for.

That cut in taxes that you were looking for—don't look now but it isn't coming. The increase in revenues must go for a much bigger defense program, now that the Reds could go completely off their nut and set fire to the world.

That year-end slogan "but the last half will probably be at a slower pace than the first half" may be wrong again in 1957.

Some of the steel plates you need—and expect—may go to oil lines and tankers, with little you can do about it. The "highly placed" government people who tell you not to worry now may not be so accurate with their crystal-ball gazing.

When you revise your plans for 1957, remember this is a new era—one that can produce events which knock things out of kilter in a split second. Once you believe that, there should be no surprises.

There never were any easy solutions!

Tom Campbell

EDITOR-IN-CHIEF

New...

ELPAR RAM TRUCKS

ONLY THE "R" SERIES RAM TRUCKS GIVE YOU SO MANY VALUES!

ELPAR designers and major steel mill engineers worked together to design this brand new line of coil handlers.

These trucks combine the best of previous models, plus new features learned from over thirty years' experience building heavy-duty ram trucks. You can count on "R" series ram trucks to handle more tons per hour than ever before!

Check These Design Features:

Narrowest Ram Truck Built . . . Get more efficient use of storage space and operate in narrower aisles.

Power Actuated Hydraulic Wheel Brakes . . . Actually two independent braking systems for maximum safety.

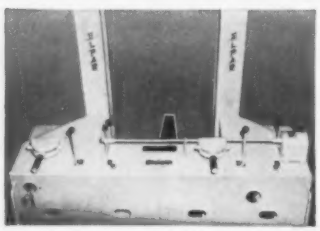
Picture Window Vision . . . Lift chains are eliminated for perfect vision between uprights.

Countless Safety Features . . . You'll find it hard to count all the features that assure safety to the load, operator and truck.

Dual Power Plants . . . Maximum power and flexibility. Drive motors are fully protected inside the frame.

The "R" series ram trucks will surprise you with their dependability, safety and economy.

Ask for new bulletin—"R" Series Ram Trucks.



Close-up of operator's field of vision. Note how clearly he can see the tip of the ram, for easy spotting of loads. Controls permit right, left or center operation.

Available in Capacities From 20,000 to 80,000 lbs.

THE ELWELL-PARKER ELECTRIC CO. • 4299 St. Clair Avenue • Cleveland 3, Ohio

dear editor: *letters from readers*

Our "Small" Allies

Dear Mr. Campbell:

Thank you for your Editorial: "Our Foreign Policy is Sound" (Nov. 8). It has the great merit of frankness.

Allow your very small allies, English and French, *not* to be in agreement with you. Of course, we understand that our small and old countries are no more valuable between the two giants: USSR (and China) and U. S. Of course, it is regrettable that the three allies could not act together in Egypt. And we know that a leader always must consider the temper of his people.

Of course, the public is always indifferent to the dangers of other nations, even friendly nations.

It is, as the old proverb has it, a question of "Whose ox is gored."

Amongst the numerous editorials I have read on the subject, let me tell you briefly that the more realistic, and true, from our European point of view were those from David Lawrence "Today in World Affairs"—particularly *Herald Tribune* 5th and 6th of November. He is to my mind your soundest and most realistic editorial writer.

I wish our American friends would follow his path.

Sorry you did not.

However,

Faithfully yours,
Pierre Dufour
Levallois, France

Cartoonist Leaves Ranks

Sir:

You may recall the writer as one who has contributed cartoons (see cut) to your magazine and who asked for permission to reprint one of your fine editorials in a direct mail piece a short time back—for which permission was granted.

Since then I have entered into a partnership here in Hartford in the sale of industrial tools.

Some of the lines handled are, BESLY-WELLES, MOTCH & MERRYWEATHER, HARTFORD MACHINE SCREW, CHICAGO DIAL INDICATOR, INDUSTRIAL BENCH, FORD CARBIDES, etc., etc.

To make our advertising approach different from the others



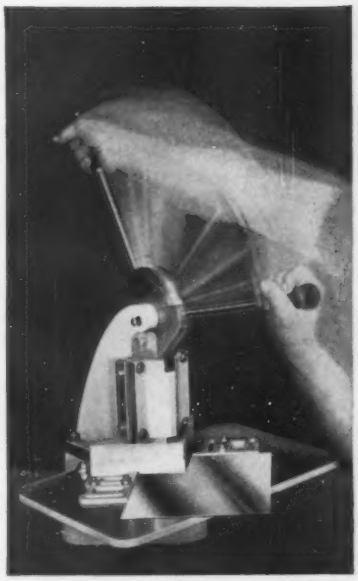
Oh, we're just an average family.

now out we have entertained the hope that we can offer an editorial each month by top management personnel.

Would you be willing to start us off? Could we publish one of your IRON AGE editorials, with due credit given?

Seems that I always am in an asking frame of mind but believe me you can always count on me as one of your readers every week. I take the liberty of quoting you on many occasions—but facts and predictions are such that I am not worried. — *R. S. Wahatalo, Pres. Libb Tool Co., Hartford, Conn.*

Best wishes on your new venture. Feel free to reprint any editorial that suits your fancy. We hope this doesn't mean that you won't still have time to do a cartoon for us once in a while.—Ed.



Notching Sheet Materials?

Do It Quickly, Easily with a DI-ACRO* NOTCHER

Speed up notching operations, eliminate the need for heavy presses and dies with a Di-Acro Notcher. A 6"x6" notch can be made in 16 gauge material in one operation. Many straight shearing jobs also performed.

*pronounced DIE-ACK-RO



BOTH HAND AND POWER OPERATED MODELS AVAILABLE

Di-Acro Power Notcher is especially designed for operations where high rate of production must be maintained. Motor driven flywheel and all moving parts housed in welded, steel cabinet.

Hand operated Di-Acro Notcher is ideal for short run production or experimental use.

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di-acro PRECISION METALWORKING MACHINES



G.T.M. increases acid hose life by 900%

ACID—66° Baume Sulfuric—was the problem at this eastern steel mill. Many types of hose were tried for its transfer from truck to storage tank. But the best hose delivered *only 2,500,000 lbs.* of acid, before embrittling and breaking.

Then the G.T.M.—Goodyear Technical Man—recommended his new HYSUNITE Hose, specifically developed to handle highly oxidizing acids in high concentrations at temperatures up to 100° F. This rugged hose handled a fabulous *26,500,000 lbs.* of acid—was good for many more pounds—when it was removed from service for thorough checking.

If you have hose problems, it will pay you to consult your Goodyear Distributor and/or the G.T.M. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

HYSUNITE HOSE by

Hysunite—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

THE GREATEST NAME IN RUBBER

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

fatigue cracks

$64,000 Question

There's no question that Lynn Dollar, who operates the IBM sorting machine on the "$64,000 Question" TV show is a pretty good looking gal.

Last week she was in the Philadelphia area beating the drums for Revlon, the show's sponsor. So — Ernie Kopecki, Advertising Manager of Selas Corp., couldn't resist (who could?) inviting her to Dresher, Pa., to give the firm's sorting equipment the once over.

Angle was that each of Selas' 13-industry customer groups has



a "$64,000" question on furnaces and other heat processing equipment—and Miss Dollar was just the one to handle them (come now!). Anyway, here she is (see cut) handing over any inquiry to Ed Fortin, VP-Treasurer of Selas.

We don't know what the question was, but she can ask us one anytime.

More Money Questions

Another big question facing metalworking these days is how to pay executives. Job-hopping of management and engineering people is at an all time high.

And it's focussing more and more attention on the problem of hiring and holding top-notch personnel.

Next week the editors will try to throw some light on the subject. "How To Figure Executive Pay" —No. 3 in the Survey Report to Management Series—will give current facts on salaries, bonus plans and other income for top management, middle management and engineers.

Whatever group you're in, you won't want to miss this one.

Know Any Technical Writers?

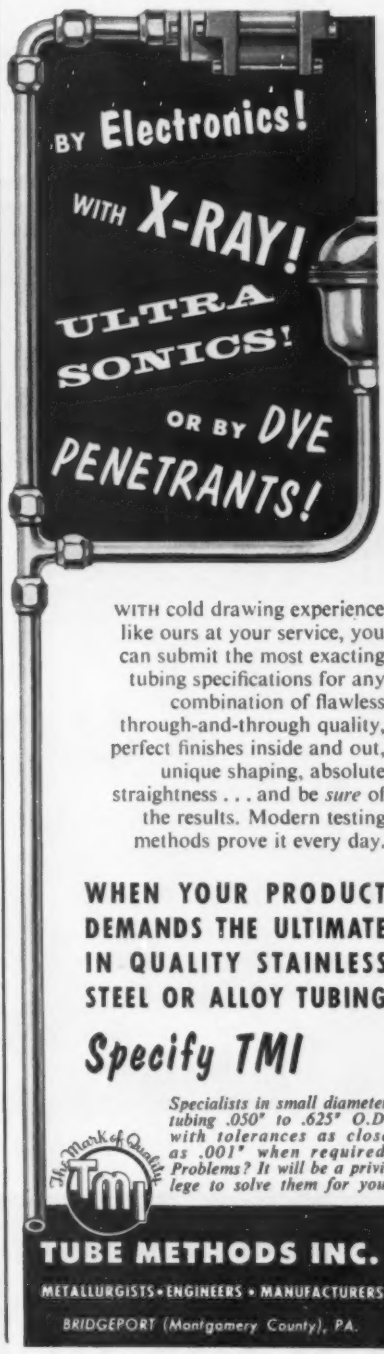
There's a spot open on THE IRON AGE editorial staff for a young engineer with a good industrial background. He needn't have a degree but he should have the equivalent of one in practical experience.

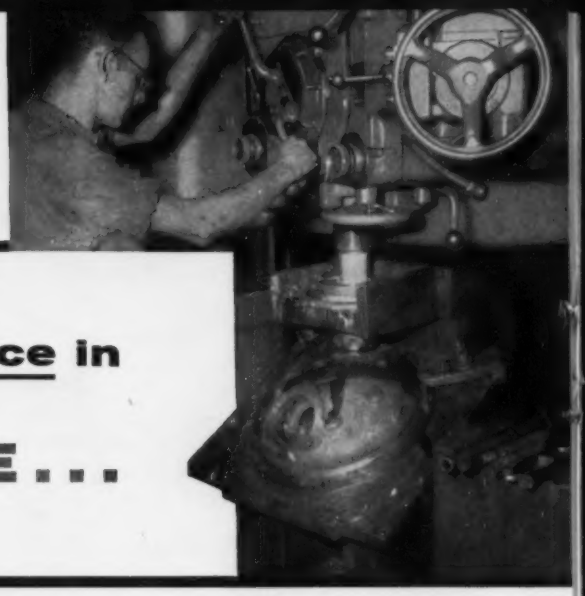
It's interesting work—about as far from routine as you can get. It would mean some travel, visiting plants, technical society meetings and the like. The editors cautioned us against trying to compete on a "Philadelphia-way-of-life pitch." Quite frankly, you can't go swimming around here in December. And it may take all of 20 minutes to half an hour to get to and from work. We don't have a golf course behind the plant, either.

They tell us that this man need not be a great creative writer. They don't want a man who wants to "break into the writing game," because, while it's fun some of the time, it's not a game. This fellow should be able to put his thoughts down in plain English: our engineering readers don't care for fancy words, they just want the facts.

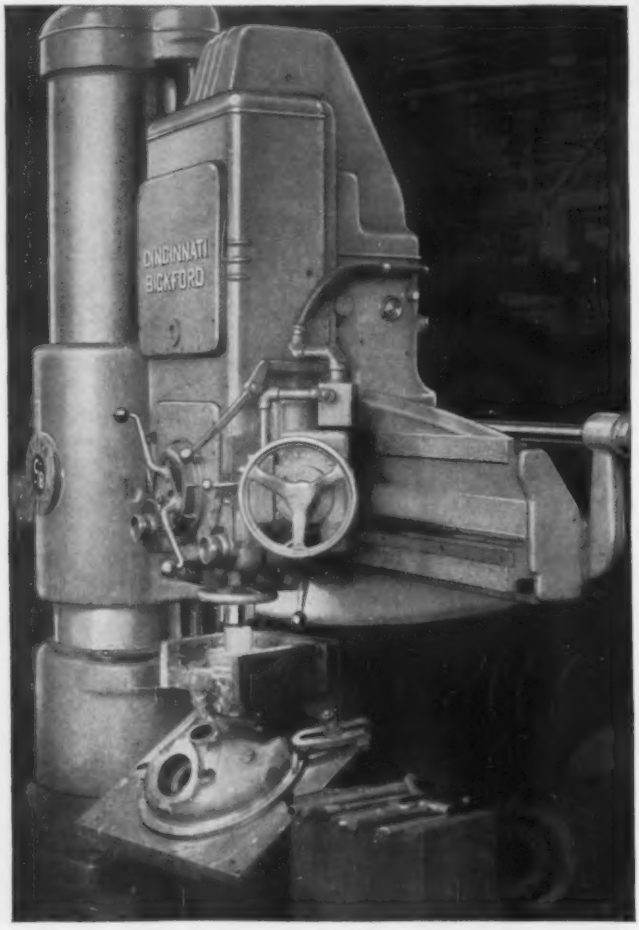
If you know a potential editor just tell him to write the editor at the address on the bottom of p. 2.







There is so much difference in its PERFORMANCE . . .



says:

JOY MANUFACTURING COMPANY
MICHIGAN CITY, INDIANA

Shown here is one of several new modern Super-Service Radial Drills recently installed in the plants of Joy Manufacturing Company. This one at Michigan City, Indiana, is boring air compressor cylinder heads for 5½" dia. valve cages. Of this machine the user says: "It is so much better in its performance and ease of handling that it is difficult to describe".

Two convenient dials control the complete hydraulic preselection of all speeds and feeds. Controls for hydraulic clamping of column, arm and head; and for arm elevation by power are at the operator's finger tips. Write for Booklet R-33, describing this ultra-modern tool.

CINCINNATI BICKFORD

SUPER C·B SERVICE

RADIAL AND UPRIGHT DRILLING MACHINES

CINCINNATI BICKFORD DIVISION
GIDDINGS & LEWIS MACHINE TOOL COMPANY
OAKLEY, CINCINNATI 9, OHIO, U.S.A.

dates to remember

DECEMBER

American Institute of Chemical Engineers—Annual meeting, Dec. 9-12, Statler Hotel, Boston. Society headquarters, 25 W. 45th St., New York.

The Material Handling Institute—Annual meeting, Dec. 10-11, Biltmore Hotel, New York. Society headquarters, One Gateway Center, Pittsburgh, Pa.

EXPOSITIONS

American Society for Metals—March 25-29, Los Angeles.

American Foundrymen's Society—May 6-10, Cincinnati.

JANUARY

Institute of Scrap Iron & Steel, Inc.—Annual convention, Jan. 13-16, Eden Roc and Fontainebleau Hotels, Miami Beach, Fla. Society headquarters, 1729 H St., N.W., Washington, D. C.

Society of Automotive Engineers, Inc.—Annual meeting, Jan. 14-18, The Sheraton-Cadillac and Statler Hotels, Detroit. Society headquarters, 29 W. 39th St., New York.

The Society of Plastics Engineers, Inc.—Annual national technical conference, Jan. 16-18, Hotel Sheraton-Jefferson, St. Louis, Mo. Society headquarters, 34 E. Putnam Ave., Greenwich, Conn.

Malleable Founders' Society—Semi-annual meeting, Jan. 18, Hotel Cleveland, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

Compressed Gas Assn., Inc.—Annual meeting, Jan. 21-23, Waldorf-Astoria, New York. Society headquarters, 11 W. 42nd St., New York.

American Standards Assn.—Gaillard seminar on industrial standardization, Jan. 21-25, Engineering Societies Bldg., New York. Society headquarters, 70 E. 45th St., New York.

American Boiler Manufacturers Assn. & Affiliated Industries—Mid-winter meeting, Jan. 22, Hotel Statler, Cleveland. Assn. headquarters, 1571 W. 117th St., Cleveland.

Industrial Heating Equipment Assn., Inc.—Annual meeting, Jan. 28-29, The Shoreham Hotel, Washington. Assn. headquarters, 1145 19th St., N.W., Washington, D. C.

Cutting Tool Mfrs. Assn.—Annual meeting, Jan. 29, Detroit Yacht Club, Detroit. Assn. headquarters, 416 Penobscot Bldg., Detroit.

FIRE! HOW TO DETECT AND EXTINGUISH IT IN SECONDS!

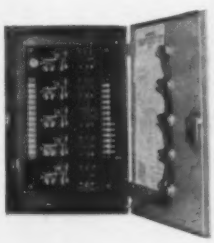
HAND PORTABLES



Carbon Dioxide | Foam Soda-Acid Clear Water Anti-Freeze | Pressurized Water Anti-Freeze | Dry Chemical

Kidde CO_2 portables, either trigger-release type or squeeze-valve type models, are available in sizes from 2½ to 20-pound capacities. New Kidde Wet Chemical Extinguishers are available in 2½ gallon bronze or stainless steel models, including pressurized Water or Water-Anti-Freeze units (illustrated). Kidde Dry Chemical extinguishers are available in cartridge-operated models of 20 and 30 pounds capacity or pressurized models of 5 and 10 pounds capacity.

ATMO DETECTING SYSTEMS

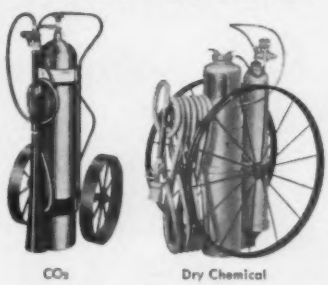


Kidde-Atmo is a wide-area automatic fire detecting and warning system which works on the principle of rate-of-temperature-rise. It is ideally suited for cases where life protection is of vital importance, or where quick, early detection of fire in valuable materials is essential.

The very first hot breath of fire triggers the system, and sounds the alarm. In addition, the system can also close doors, shut off fans or blowers – all *automatically*.

What's more, the Kidde-Atmo system operates independently of regular power sources, will still give protection even if outside power fails.

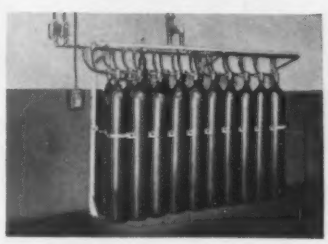
MOBILE EQUIPMENT



CO_2 | Dry Chemical

For major fire hazards, get a mobile unit. Wheeled CO_2 units are available in 50, 75 and 100-pound capacities, in one clyinder. 150-pound Dry-Chemical unit has straight stream for long range ... fan pattern for wide coverage. Both units give expert results even with inexperienced operator.

CO_2 SYSTEMS



New Kidde pressure-operated CO_2 extinguishing systems are individually designed to fully protect even the most dangerous hazards. Directional Valves afford protection to more than one hazard using the same bank of CO_2 cylinders.

Kidde

Walter Kidde & Company, Inc.
1028 Main Street, Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd., Montreal — Toronto

"Operations Kingsbury" . . . change die castings into interchangeable pump bodies

This oil pump body starts with a die casting. The piece is not machined prior to the time it enters the Kingsbury. When it leaves the Kingsbury, it's ready for assembly.

Work is required from three general directions: the mounting surface, the cover face and the top. It was decided to perform all operations in two chuckings, passing each piece through the machine twice.

The central column machine has 18 Kingsbury units — six with auxiliary heads. Twenty work-holding fixtures are mounted in pairs on an index table which indexes through ten stations — one for loading and unloading.

Operator places the die casting in the right-hand fixture, locating the pre-formed hole (No. 10) over a spring-actuated plug. A spring loaded ram closes the fixture, locating the piece correctly.

In the first trip through the machine, 14 spindles complete six holes and mill the mounting face. This work provides an accurate surface with precise locating points for the second chucking, in which 17 spindles complete eight holes and mill and trepan the cover face.

Result . . . each milled surface is uniformly accurate in finish and angle relationship — each hole is of proper size and is located correctly. Result again . . . interchangeability, which is what was wanted, plus rapid and economical production, of course.

An automatic machine cannot produce uniformly accurate work unless its work-holding fixtures are *designed correctly and precision-built.* You get *both* when you get a Kingsbury.

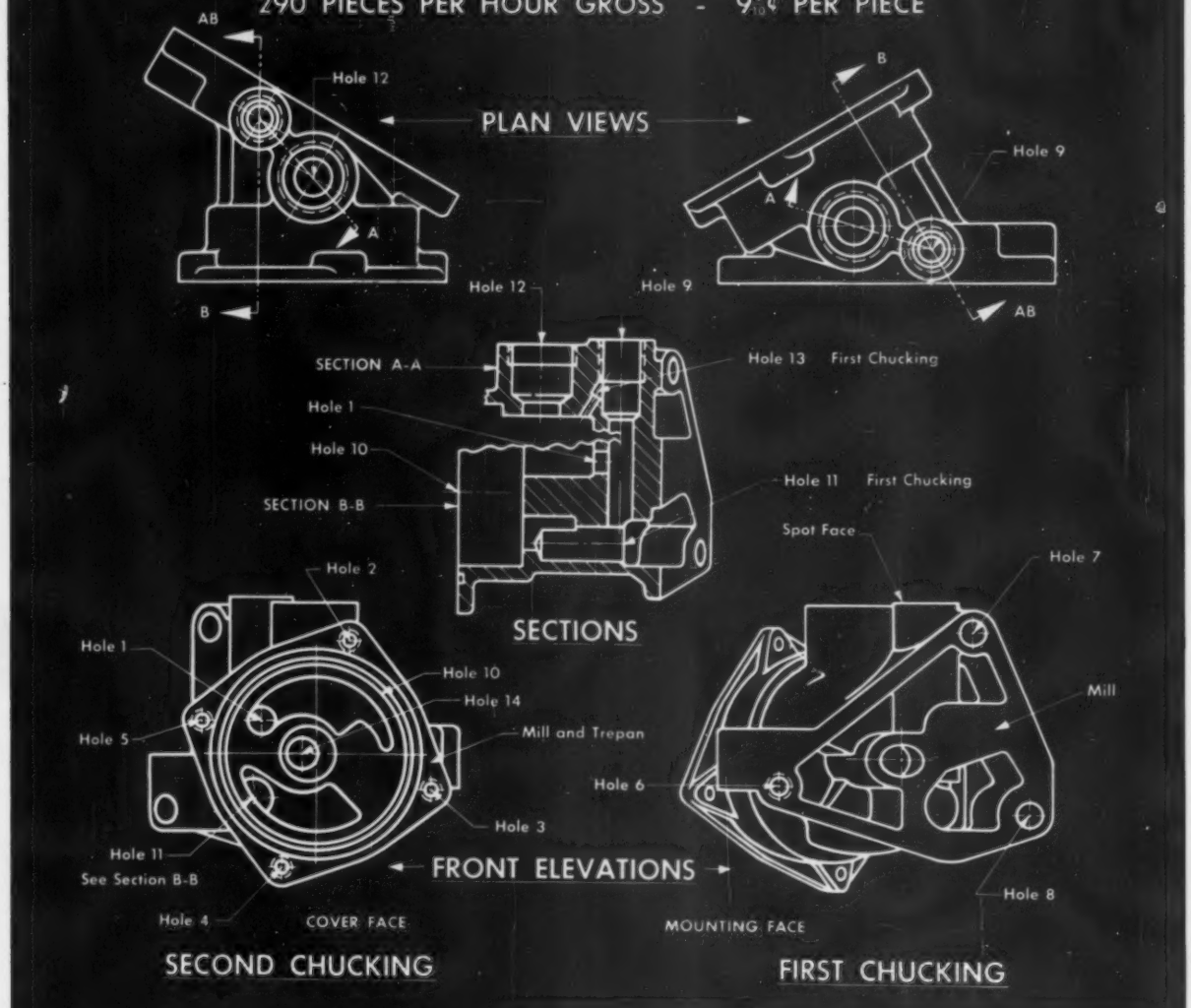
Kingsbury Machine Tool Corporation
120 Laurel Street
Keene, New Hampshire

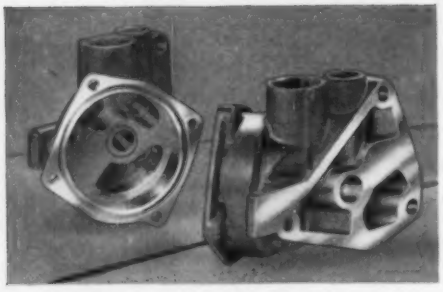


OIL PUMP BODY - Aluminum Alloy Die Casting

32 SPINDLE OPERATIONS FROM FOUR DIRECTIONS

290 PIECES PER HOUR GROSS - 9 9/10¢ PER PIECE

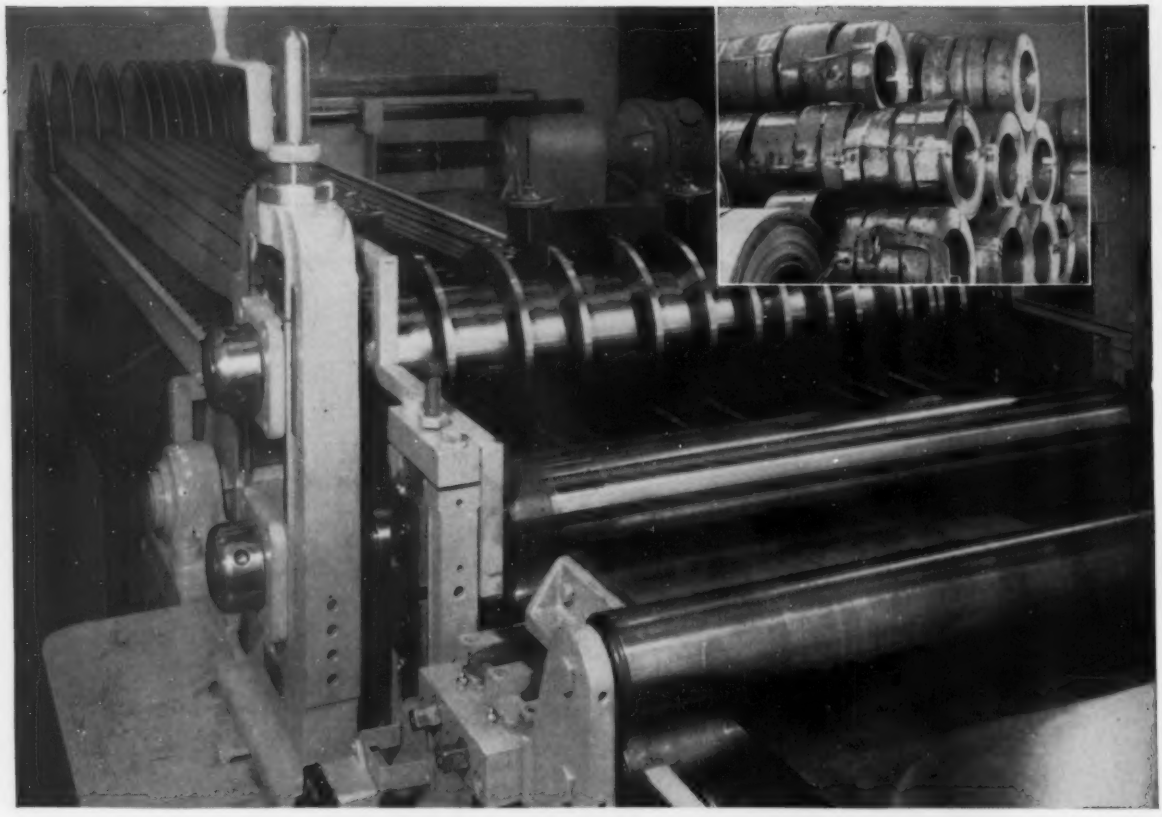




Mirror photograph shows 13 of the 14 holes, and the two surfaces — completed in two chuckings.

FIRST CHUCKING		
HOLE NO	STATION	WORK
6	1-H 4-H 8-H	Tap Drill Undersize Ream Tap
7	1-H 4-H	Drill Undersize Ream
8	1-H 4-H	Drill Undersize Ream
9	4-V 5-V 8-V 9-V	Core Drill Undersize (two dias.) Spot Face Boss Ream Tap
11	6-HR	Drill to remove Flash
13	7-AR	Drill
Mount Face	2-V	Mill

SECOND CHUCKING		
HOLE NO	STATION	WORK
1	1-H	Core Drill
2	1-H 3-H	Tap Drill Tap
3	1-H 3-H	Tap Drill Tap
4	1-H 3-H	Tap Drill Tap
5	1-H 3-H	Tap Drill Tap
10	4-H 6-H 7-H	Comb. Rough Bore* Finish Bore Finish Bore
12	7-V 8-V	Ream Tap
14	8-H 9-H	Rough Ream Finish Ream
Cover Face	2-V 4-H	Mill *Comb. Trepan



...these things and others, too, a Yoder Slitter can do for you...

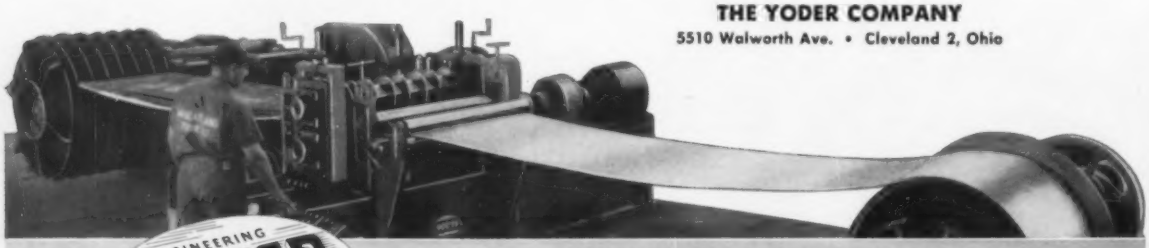
By doing your own slitting, you may easily save $12,000 or more per year in slitting cost alone, on requirements as low as 100 tons per month.

But don't make the mistake of thinking this is the only saving or advantage enjoyed. Many owners realize equally important savings by being able to buy standard width coils competitively, from more numerous sources of supply—wherever they can get the best price and quality. Much quicker deliveries are also obtainable in this way.

Inventory requirements, too, are greatly reduced and production planning simplified because, from a relatively small stock of mill-width coils or sheets, you can meet expected and unexpected needs for slit strands in a few hours.

Send for the Yoder Slitter Book—a comprehensive text on the mechanics and economics of slitters and slitting line operation, with time studies, cost analyses and other valuable data. It's yours for the asking.

THE YODER COMPANY
5510 Walworth Ave. • Cleveland 2, Ohio



ENGINEERING YODER MANUFACTURING

ROTARY SLITTING LINES

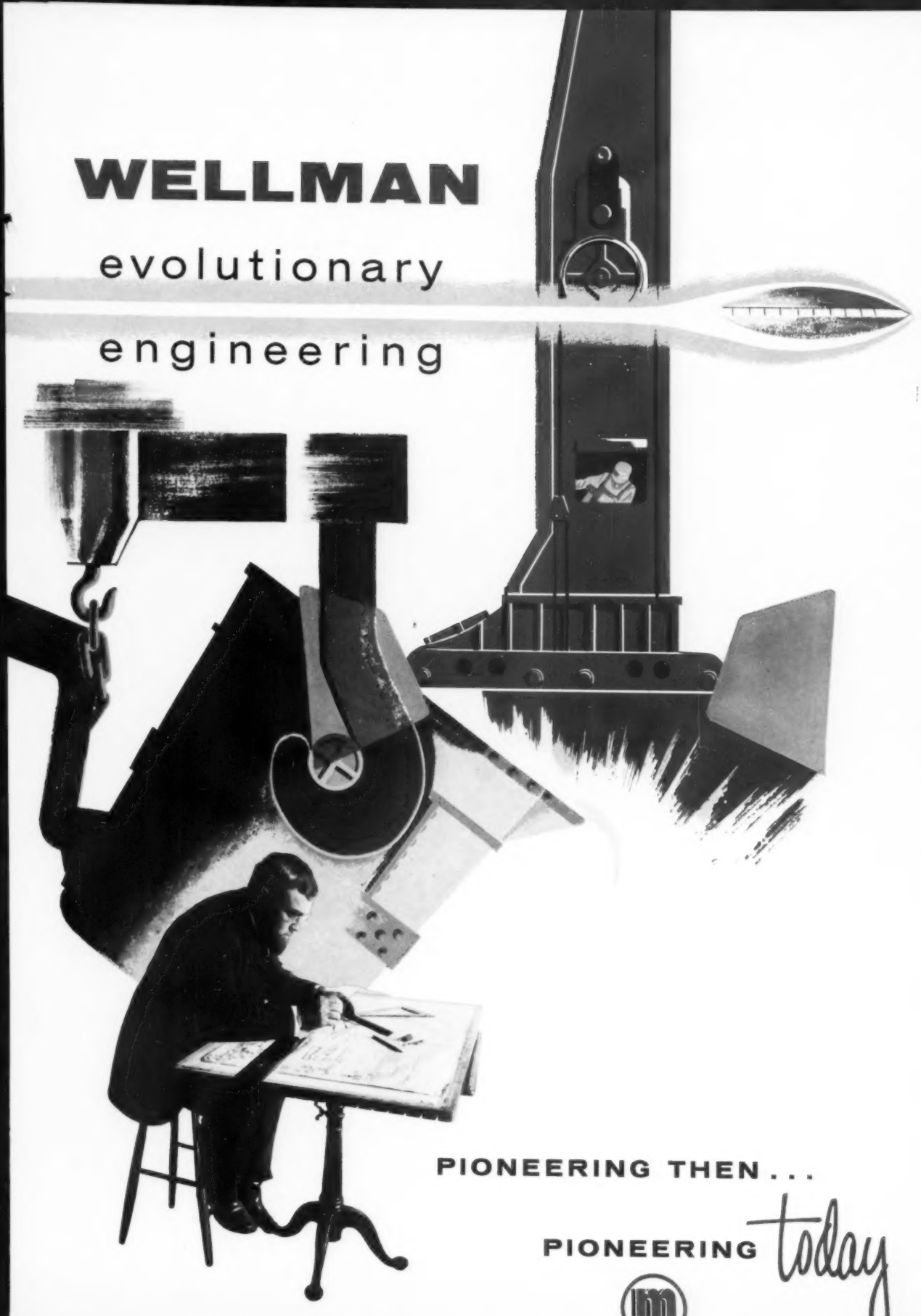
COLD ROLL FORMING MACHINES

ELECTRIC-WELD PIPE AND TUBE MILLS

WELLMAN

evolutionary

engineering



PIONEERING THEN . . .

PIONEERING *today*

M·DOWELL

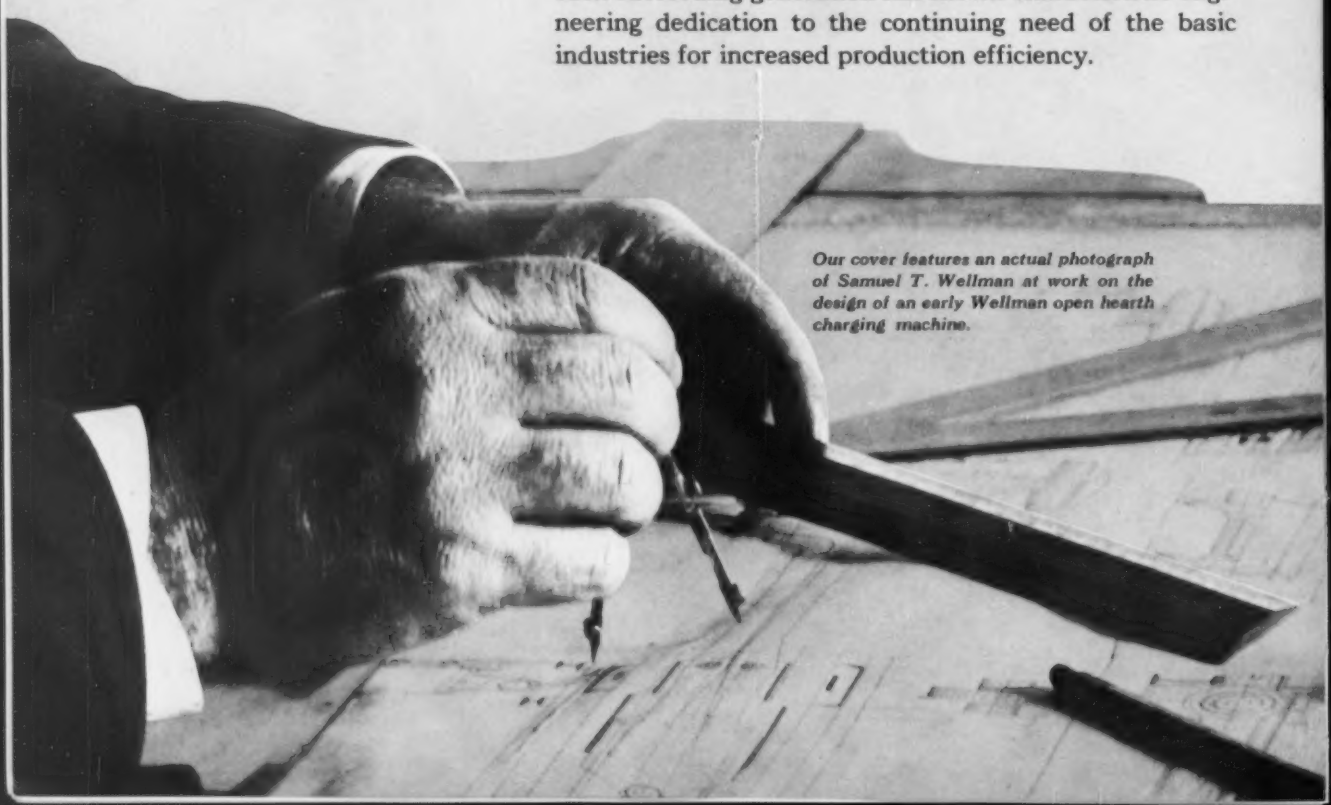
The Wellman Engineering Company celebrates

1896 **60** 1956

YEARS OF SERVICE

Serving the stalwarts of America's great industrial community throughout the years of our mutual growth, Wellman creative engineering is identified with the development of unique mechanical entities which live, which perform the functions of many hands.

Building upon the pioneering work of its founder, Samuel T. Wellman, "father of the open hearth process of steelmaking in the United States", Wellman equipment for each succeeding generation has shown characteristic engineering dedication to the continuing need of the basic industries for increased production efficiency.



Our cover features an actual photograph of Samuel T. Wellman at work on the design of an early Wellman open hearth charging machine.

in Steel-Making Machinery

Wellman builds a complete range of coke plant equipment, including coal charging cars, coke guides, coke oven doors, combination coke pusher, coal leveler and door extractor machines, coke side door extractors, and coke quenching cars.



TO BASIC INDUSTRY

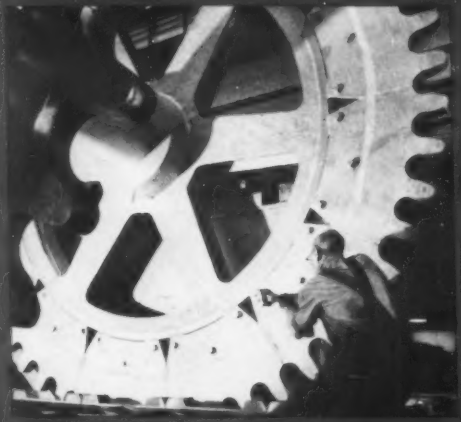
in Bulk Materials Handling Systems

World's largest belt conveyor iron ore stocking bridge classifies Venezuelan ores.



in Special Fabrications

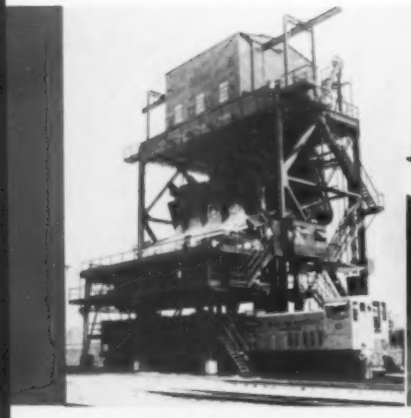
Skilled craftsmen working with precision tools and equipment in the Wellman shop fabricate machinery of every size and complexity.



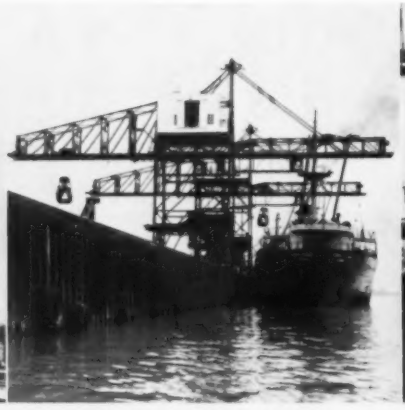
Pioneering still, Wellman engineering for the age of automation expresses an intimate understanding of the demand of today's heavy industry: mechanical equipment, more nearly human than ever, created from contemporary concepts of plants and processes, thus making Wellman's contribution to the American ideal of producing more goods for more people with greater economy.

In 1954, Wellman joined the family of related enterprises of McDowell Company, Inc., engineers and contractors serving the basic industries. Through this purposeful alliance, Wellman engineering and fabricating facilities are broadening the scope of the McDowell Method, which is at work on the new frontiers of turnkey planning . . . rooted in economics as well as engineering . . . and embracing design, construction and complete mechanical installation of going plants, delivered in operation.

TO BASIC INDUSTRY . . . . . .



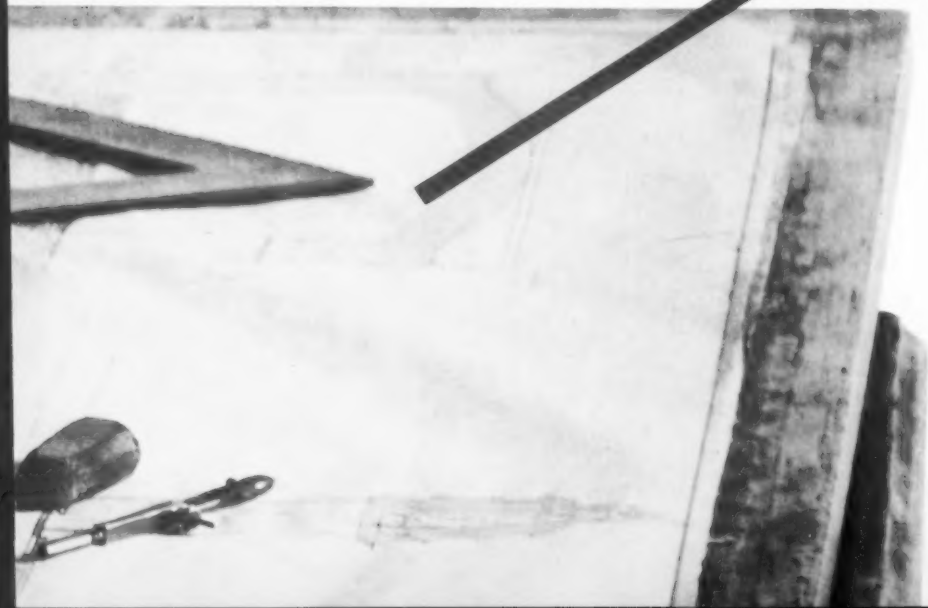
Wellman 90-ton turn-over cardumper, with motor operated gates, at a midwestern steel plant.

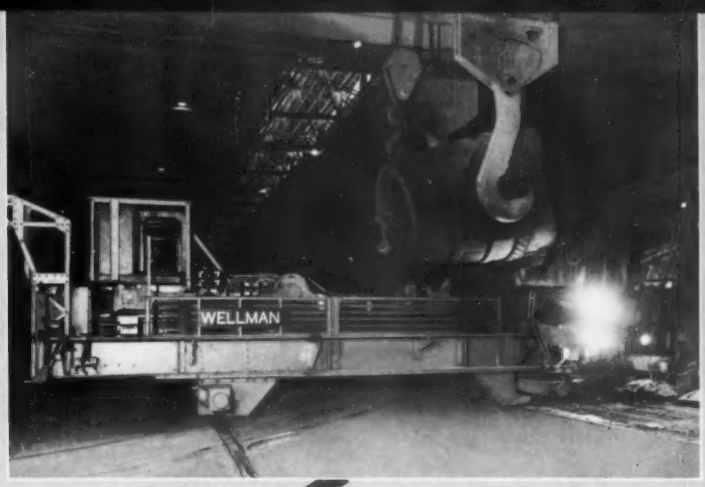


At a Canadian trans-shipping station, two Wellman 12-ton towers unload iron ore from Labrador.



Biggest Huletts ever built, these 20-ton machines operate on tracks curved to a 65 degree arc at a Lorain, Ohio, dock.





Wellman charging machines remain the first choice of open hearth operators today, 68 years after Samuel T. Wellman created the first of them.

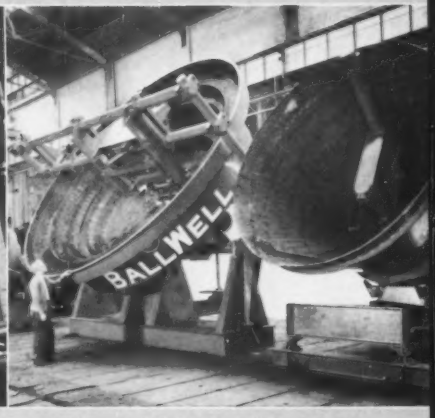
from mine...to mill...through finished product



Wellman pulpwood handling plant solves storage problem for southern U. S. paper producer. Bridge pivots on pier to negotiate circle, is equipped with 1¼-cord Williams grapple.



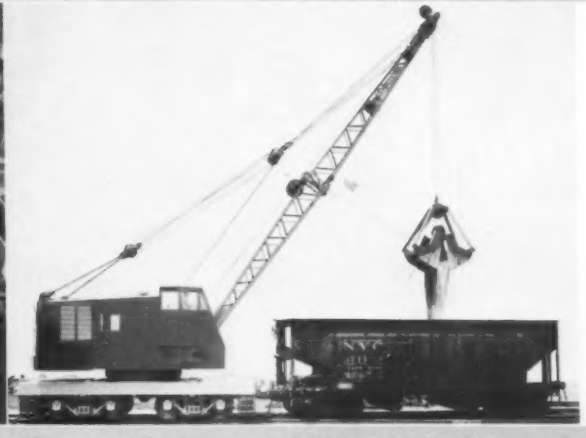
Big tough Williams 325 cubic foot ore bucket gives great service on the ore dock of a Cleveland steel mill. Wellman offers a complete line of Williams industrial buckets.



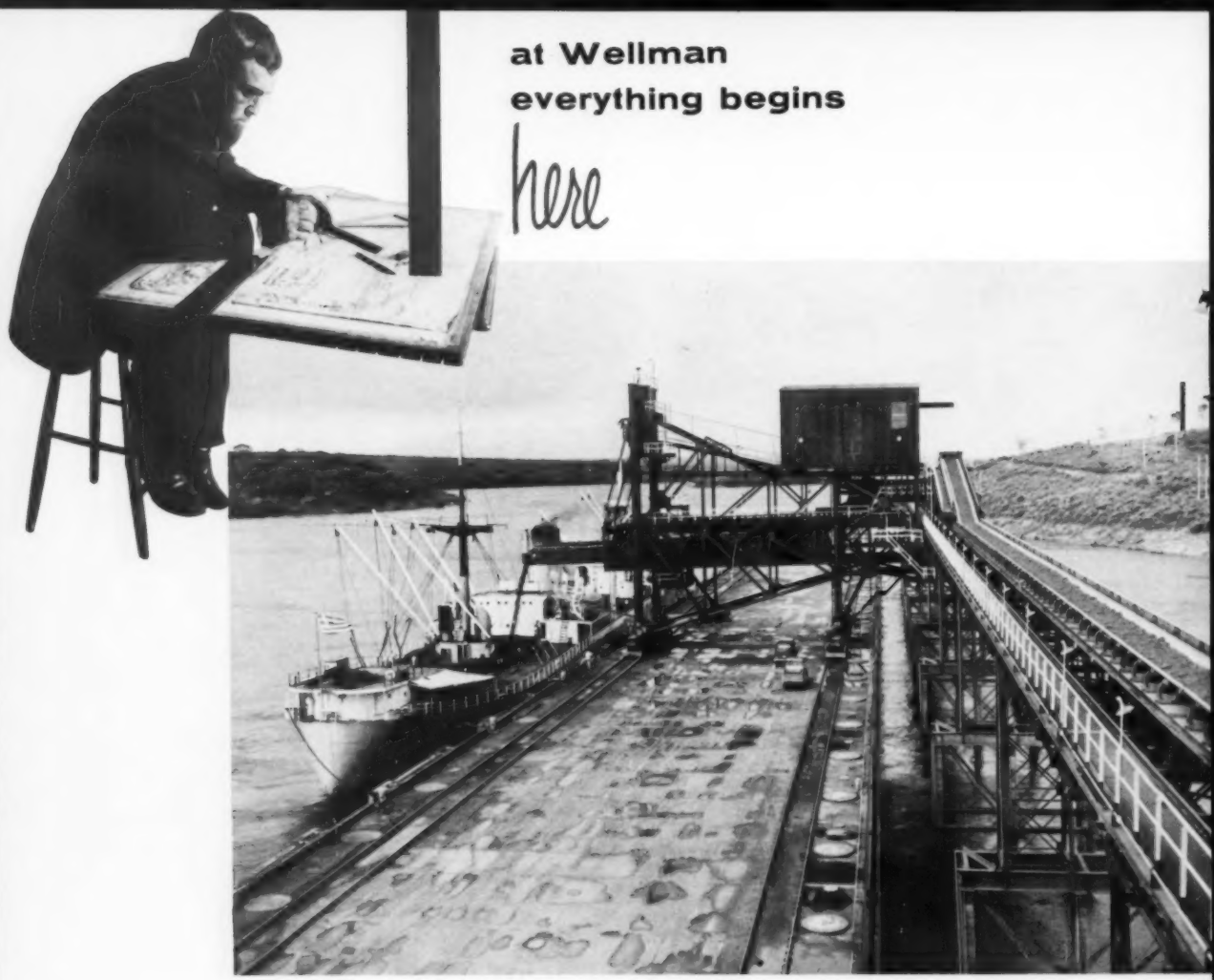
Wellman fabricates McDowell Company's Flying Saucer, newest development in fines agglomerating, and Dwight-Lloyd sintering equipment.



Anker-Holth air and hydraulic cylinders, engineered in standard and special designs, are swiftly replacing mechanical power motions in modern industry.



The all-new Wellman diesel electric locomotive crane features ball race rotation, speeds to 15 miles an hour, capacities from 25 to 80 tons.



at Wellman everything begins *here*

Wellman traveling shiploader handles 6,000 tons of iron ore per hour in Venezuela.

1896 **60** 1956

YEARS OF SERVICE TO BASIC INDUSTRY

Wellman's cultivated place in the field of development engineering is the endowment of its illustrious founder, Samuel T. Wellman, who brought the open hearth process of steelmaking to America.

Sam Wellman may not have known the word, but the prolific issue of his drafting board is alive with automation — a genesis manifested then as now by talented mechanical entities that live and do a job.

Today the Wellman heritage is expressed by its inquisitive engineering mentalities, exploring the manifold challenges of the basic industries — in bulk materials handling, heavy hoisting, steelmaking, gas producing, etc., all dedicated to greater production efficiency.

THE WELLMAN ENGINEERING COMPANY

7000 CENTRAL AVENUE · CLEVELAND 4, OHIO

THE McDOWELL FAMILY OF RELATED ENTERPRISES

McDowell Turnkey Plants • Dwight-Lloyd Research Laboratory • Wellman Bulk Materials Handling Systems and Steelmaking Machinery • Anker-Holth Power Cylinders • Dwight-Lloyd Ore Beneficiating Plants • ABCs Belt Conveyor Scales • Williams Buckets • Wellman Locomotive Cranes

7138 WE

LITHOGRAPHED IN U.S.A.



Want to make every day Christmas?

It's easy! Switch to CINCINNATI (PD)° WHEELS. For *now* CINCINNATI Grinding Wheels offer POSITIVE DUPLICATION—a remarkable achievement in precision manufacturing and quality control that *can save you money . . .* and *increase your production.*

You'll say there *is* a Santa Claus after all when you learn that through the CINCINNATI (PD) Manufacturing Process you are assured Positive Duplication of the original wheel every time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS *are priced no higher than ordinary wheels.*

So, to make every day Christmas, just contact your CINCINNATI Grinding Wheel distributor. Or, contact us direct and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

Remember—*only* CINCINNATI Grinding Wheels give you . . .

(PD) POSITIVE DUPLICATION

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

CINCINNATI° *Grinding Wheels*

°Trade Mark Reg. U.S. Pat. Off.

see what America's most modern power



SHEAR USERS EVERYWHERE TELL THEIR STORIES OF NIAGARA BENEFITS

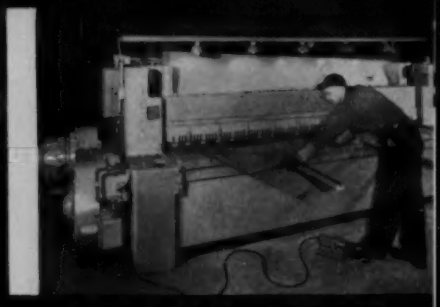
(3 of 19 Photo-Reports shown in Niagara's new Bulletin 69G)



"an exceptional machine value"
— World's Largest Trailer Mfr.



"For over 10 years . . . we have never had any downtime for repairs and maintenance."
— V-Belt Pulley and Caster Mfr.



"High quality of accuracy with the utmost in speed and performance"
— Midwest Road Machinery Mfr.



squaring shears can do for you!

Speed that spells peak productivity! Accuracy for cutting within micrometer tolerances! Ruggedness to stand the gaff on stiffest assignments! They're all yours with a Niagara Power Squaring Shear. New, fact-filled 74-page Bulletin is profusely illustrated to show you how and why:

From mass producers, fabricating plants, steel warehouses and sheet metal shops comes written evidence of the superiority of Niagara Underdrive Squaring Shears on jobs of every description. *No other shear can match Niagara's record for cutting accuracy, speed and downright economy of operation.*

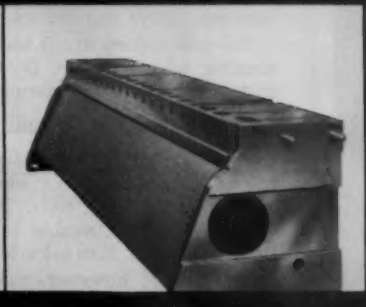
For a photo story of the many tangible ways in which a Niagara Power Squaring Shear can boost hourly output, improve quality and slice maintenance costs in your plant, make sure that you receive Niagara's newly-published Bulletin 69G by mailing the coupon below. Presenting the greatest shear story ever told this 74-page document will give you a close look at Niagara Shears in numerous applications . . . the *closest* look you have ever had at *any* shear, next to having it on your own floor! It will show you feature-by-feature why a Niagara Shear is far ahead at every point of comparison . . . and why it pays to look to America's oldest leading shear manufacturer for the most profitable answers to *your* requirements.

NIAGARA-DEVELOPED FEATURES PROVIDE THE ULTIMATE IN MODERN SHEAR PERFORMANCE

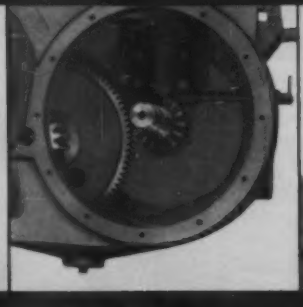
(Here's a glimpse at just a few of many. See them ALL in new Niagara Bulletin 69G)



Fully Closed Box Type Construction



Massive Bed Designed for Super Strength



Instantly Engaging Multi-Jaw Clutch



Powerful, Self-Compensating Holddown

YOURS FOR THE ASKING...

the most comprehensive shear bulletin ever published!

Months in preparation, this fact-filled bulletin now gives you valid, inside facts on the nation's top line of power squaring shears. 74 pages! 141 revealing photographs and illustrations! Specifications for nearly five dozen standard models! Capacities: 16-gage to 1" mild steel. Cutting lengths: 4 to 20 ft. Make sure that you receive a copy at once. Mail the attached coupon today.



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MAIL your new Underdrive Squaring Shear Bulletin 69G to us immediately.

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COMPANY_____

ADDRESS_____

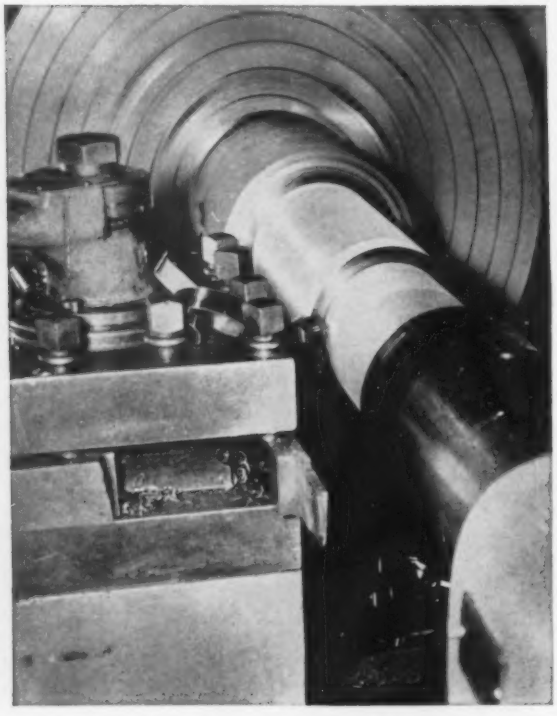
CITY_____ ZONE_____ STATE_____

IA

More production for your tooling dollar is the reason...

WHY IT PAYS TO SPEND FOR CARBOLOY EXTRA—

If you rely on "Equivalent Grade" Charts to save a few tooling pennies, these facts on carbide costs may save you thousands of production dollars



TESTS ON STAINLESS STEEL VANED ROLLS by a New Hampshire pulp and paper-processing equipment manufacturer demonstrate how the "Equivalent Grade" Charts hide tremendous differences in carbides' production abilities. With Grade "X," production per tool was limited to two pieces per grind. Machine speed had to be held down to protect the carbide.

Switching to Grade 370 brought the manufacturer 8 to 9 pieces per grind. Machine speeds were doubled; 14 hours a day in labor were saved. Result: savings of more than $100 a week, in addition to lower downtime, grinding, and inventory costs.

SO-CALLED "Equivalent Grade" Charts hide the fact that no two carbide grades will produce the same results. Because they classify carbides by broad areas of application, the Charts ignore important differences in production ability.

Thus, they mislead buyers into believing they can safely purchase the cheapest grade listed for a job.

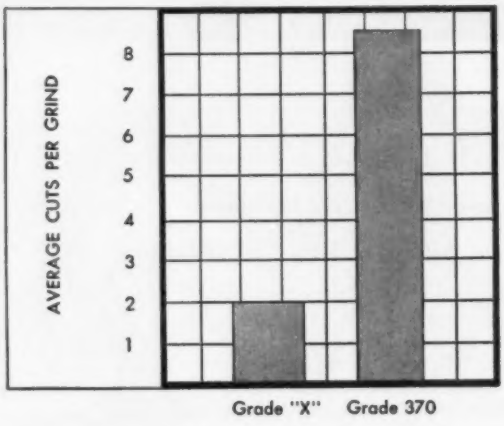
But actual tool-comparison tests have proved conclusively that the production abilities of carbides *do* vary tremendously. Moreover . . . these tests show that the pennies saved by buying on low initial cost often lead to thousands of wasted dollars . . . in lost production, lower machine efficiency, non-productive man-hours.

The case history at left is one of hundreds demonstrating why cost per finished piece – not initial cost – is the only reliable guide to buying carbides.

Results of an actual comparison test

According to the "Equivalent Grade" Charts, any one of several carbide grades could handle the job of machining these rolls. The manufacturer tried Grade "X" first – because it cost 10% less, initially, than Carboloy* Extra-Performance Grade 370.

Grade "X," however, machined only two rolls per day. Grade 370 increased production to 8 or 9 pieces per day (Graph No. 1).

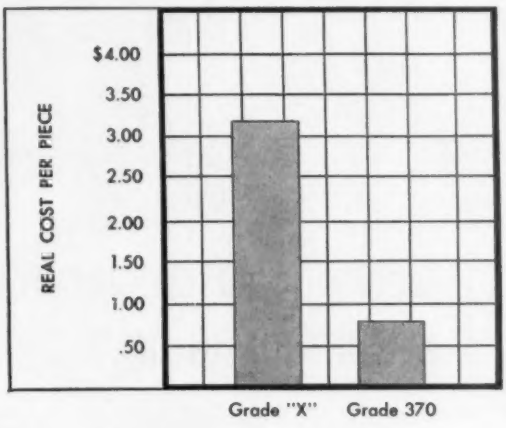


Graph No. 1—Production Ability Comparisons

A FEW CENTS MORE PERFORMANCE CARBIDES

When the *real* cost of the tools was calculated, the manufacturer found the initial saving with Grade "X" was actually *making* him *lose* more than $100 a week. Here's why:

The real cost of Grade "X" was $3.18 per piece machined (2 pieces from a $6.37 tool). The real cost of Grade 370 is just $.82 (average of 8½ pieces from a $7.01 tool). On the weekly production of 42-43 rolls, the saving totals $100.30!



Graph No. 2—Real Cost Comparisons

Yet even this eye-opening figure does not tell the whole story. The Grade 370 tool operated at twice the speed of Grade "X." It helped save the manufacturer 14 hours a day in labor. It provided twice the tool life. It eliminated a special finishing tool.

When these facts were translated into dollars and cents, the manufacturer found that downtime costs were reduced, because th tool remained on the job longer. Grinding costs were reduced, because the tool required less maintenance. Inventory costs were reduced, because a few tools did the work of many.

When added up, these amounted to a considerable saving—yet nothing in the "Equivalent Grade" Charts could have forecast it. These are savings which buying on the basis of initial cost always obscures. These are savings which more than justify spending a few cents more for carbides with extra production ability.

Carboloy Extra-Performance Carbides available for all steel-cutting jobs

Heavy-Duty Grade 370, used in the test above, is one of three Carboloy Extra-Performance Carbides. Together with Medium-Duty Grade 350 and Finishing Grade 330, these grades cover the entire steel-cutting range from roughing to finishing.

Extra-Performance Grades 330, 350, and 370 cost more, initially, because they are made by a unique and more costly process. But their performance so far exceeds conventional carbides that there are actually no "equivalent" grades for any of them. They cannot be fitted into the arbitrarily selected cubbyholes on the "Equivalent Grade" Charts now in common use.

These Extra-Performance Grades easily expose the fallacy of the "Equivalent Grade" Charts, because they are so superior to other steel-cutting grades. But even when attempting to classify conventional grades, the Charts exhibit the same fatal flaw.

Because there is no way of knowing in advance how any grade will perform on the job, we make this suggestion: Always run your own comparison tests *before* you specify a grade. When the results are in, you will find that one grade will bring your plant significant savings in tool costs, machining and labor expense.

We think you will find *that grade* will be one of the Carboloy Extra-Performance Carbides. But whatever it is, specify it *by name*. Do not settle for an "equivalent" grade.

If you would like a more detailed discussion of the whole problem of Initial Costs vs. Real Costs, and the fallacies of the so-called "Equivalent Grade" Charts, write today for a sales engineer to call on you. Send your request to: *Metallurgical Products Department of General Electric Company, 11153 E. 8 Mile Street, Detroit 32, Michigan.*

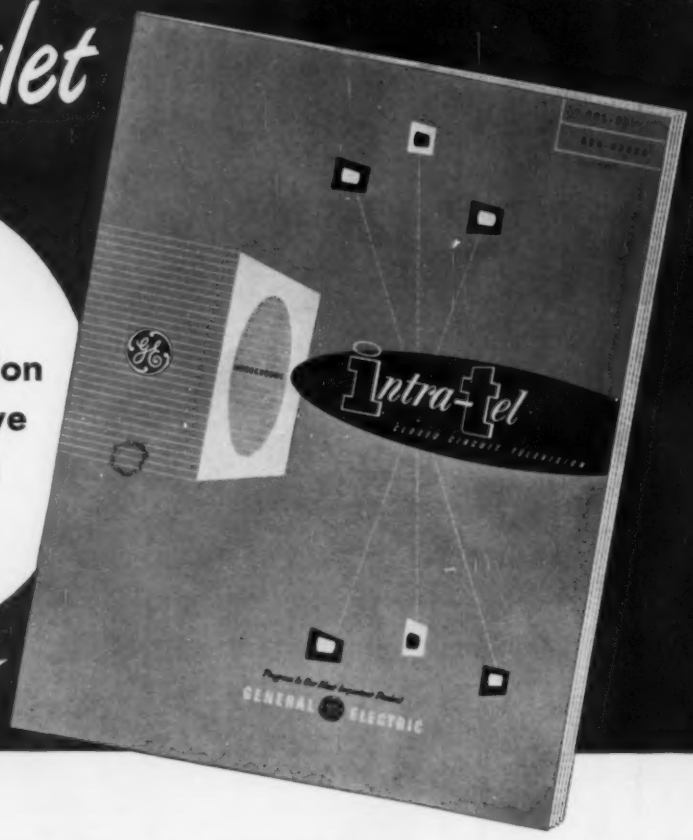
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General Electric's new booklet – INTRA-TEL CLOSED CIRCUIT TELEVISION, is just off the press. Ask for a free copy, on your letterhead, please. It tells how easily you can have dependable General Electric INTRA-TEL TV working for you. The booklet answers your questions...contains scores of applications. Don't delay – write for your copy today. Please mention Booklet ECL-53 for black and white, or ECL-39A for color. *Industrial Electronics Division, Broadcast Equipment, Section X89126-6, General Electric Company, Syracuse, New York.*

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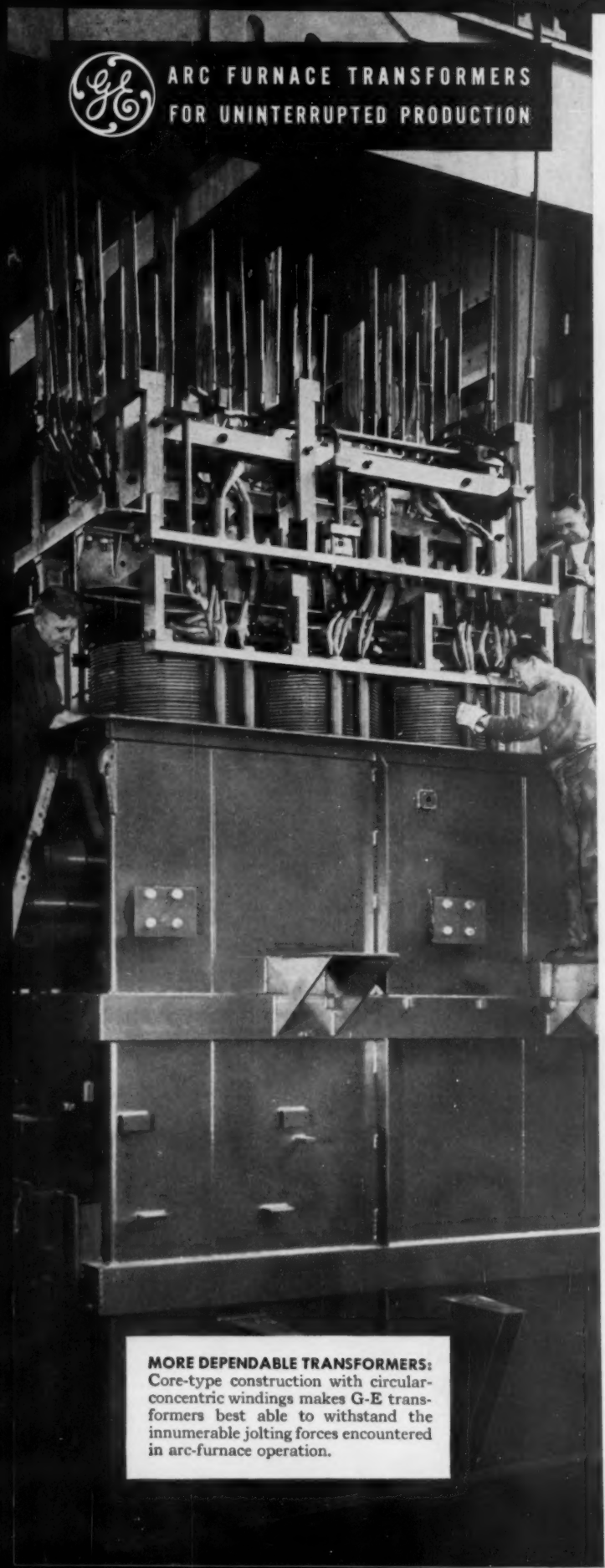
The MONITOR
Type TH-6-A. Shows the picture as taken by the camera. Conventional home-style TV receivers may be used as additional receivers or monitors.

The CONTROL UNIT
Type TH-5-A. Controls and transmits the picture from camera to monitor.



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G-E transformers keep your furnaces on the job

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GREATER STRENGTH is only one of many reasons why you should specify G-E transformers for your next arc-furnace installation. Others include: better cooling for more accurate control of hotspots, and a superior tap changer which has proved itself by a record of no contact-tip failures in over eighteen years.

For the full story, contact your nearest G-E Apparatus Sales Office or write to General Electric Company, Section 422-28, Schenectady 5, N. Y.

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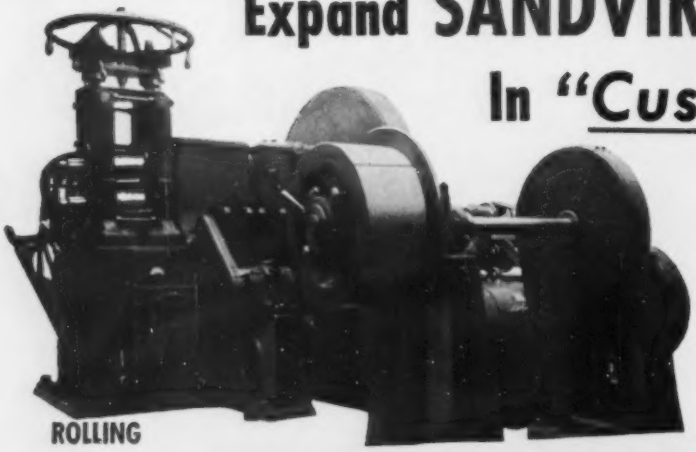
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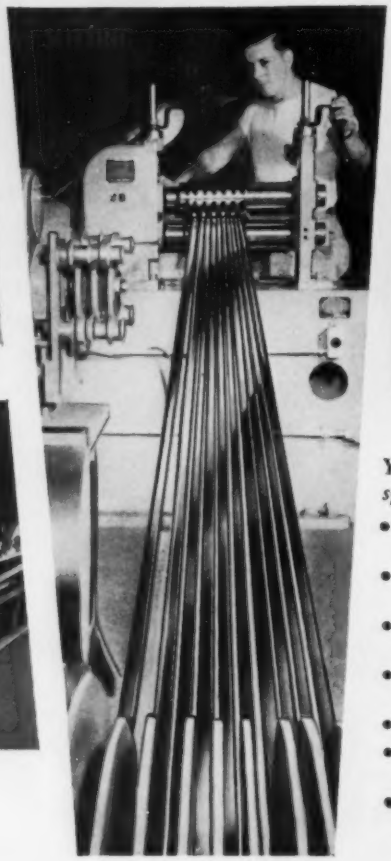
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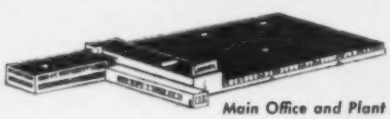
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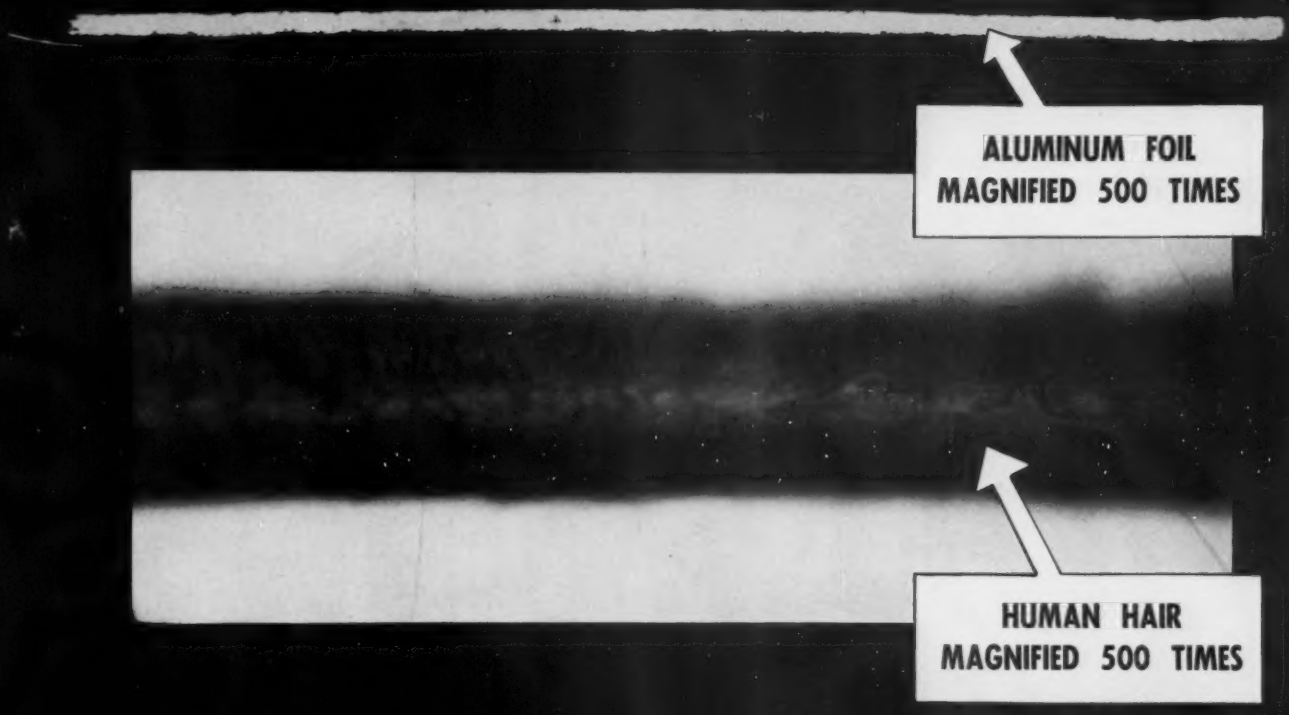
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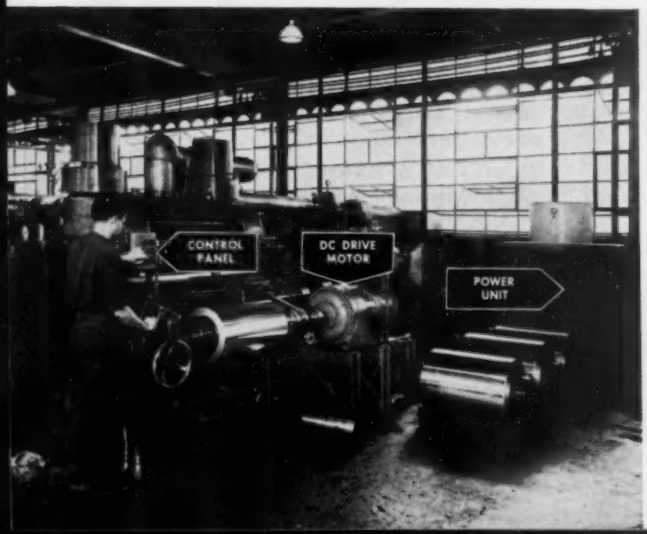
General Electric d-c drives help

Roll aluminum 1/10 the thickness of human hair

A GENTLE TOUCH—Rolling high-quality aluminum to 1/10 the thickness of a human hair takes a gentle touch. Doing it 24 hours a day, six days a week demands sturdy, reliable equipment. To obtain this combination of sensitivity and dependability Republic Foil and Metal Mills, Danbury, Conn., has installed five General Electric Speed Variators on their pay-off drives.

REDUCED DOWN-TIME—Mr. James D. Post, Vice President in Charge of Operations, reports, "The General Electric Speed Variators provide more constant tension and steady acceleration. As a result, down-time and maintenance have been reduced on this delicate work. We also like the way they stand-up under continuous operation. Our satisfaction is manifest in a duplicate order for our No. 5 mill."

THREE COMPONENTS of G.E.'s Speed Variator are shown installed on the pay-off drive at Republic Foil and Metal Mills.

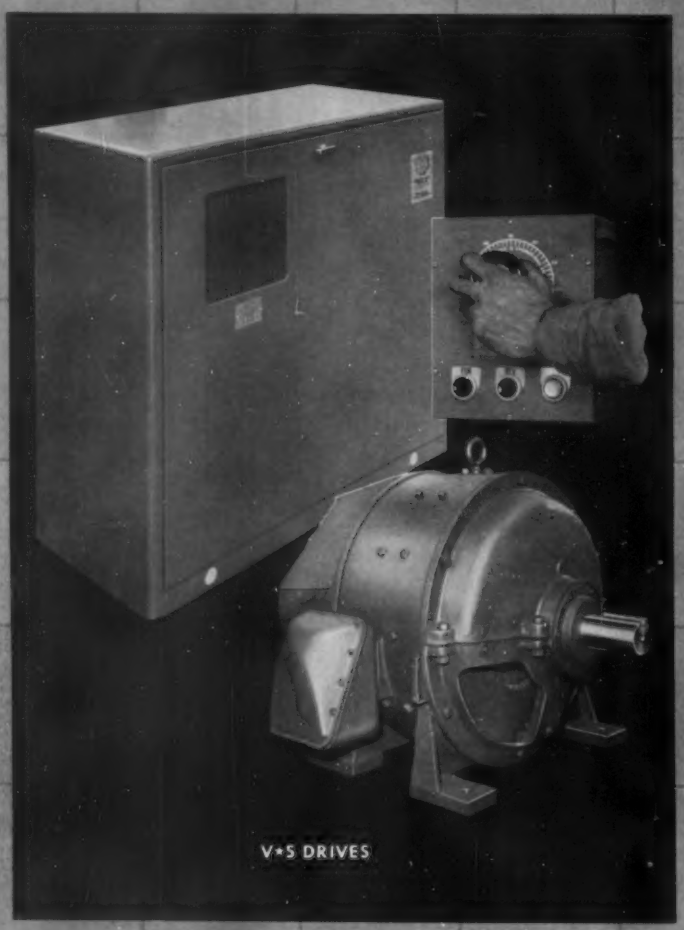


SPLIT-SECOND RESPONSE—General Electric Speed Variators are proving the answer to a variety of difficult metal rolling and slitting applications in brass, aluminum, and steel. Providing smooth, steady acceleration and split-second response to control signals, they can meet the most exacting drive requirements.

ENGINEERED TO YOUR SPECIAL NEEDS—The Speed Variator conversion unit comes assembled, wired and tested... ready to be installed on your a-c system. General Electric engineers will be glad to help you in making the most effective use of these drives. Please call your G-E Apparatus Sales Office or write for bulletin GEA-6127. *Direct Current Motor and Generator Department, General Electric Company, Erie, Pennsylvania.* 820-2

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Automation is the key to greater production of more goods and services at lower cost. The Tools of Automation can be applied profitably in a countless number of individual industries.

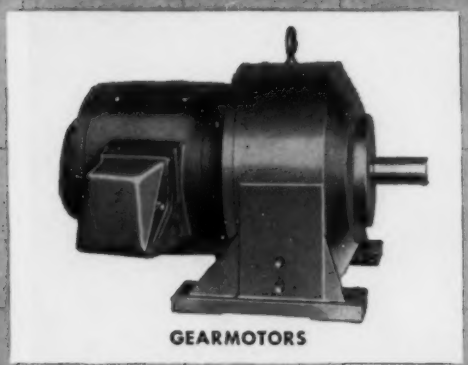
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Bulletin No. A-1555-B gives further details.

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Running in the upper speed range, sometimes at well above 250 strokes per minute, through two shifts a day—and occasionally three. And they've been doing it for a long time now with no problems.

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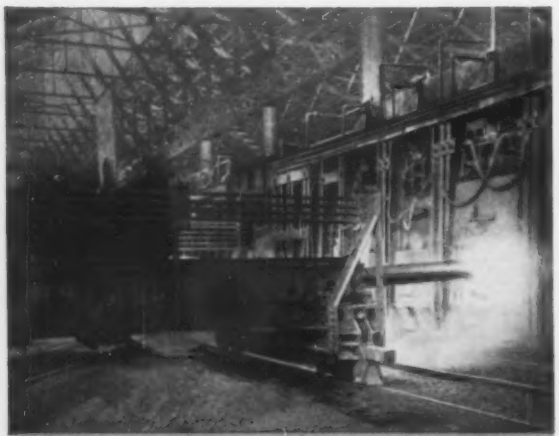
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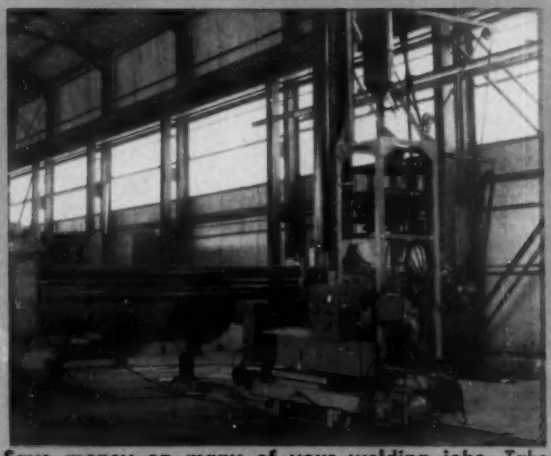
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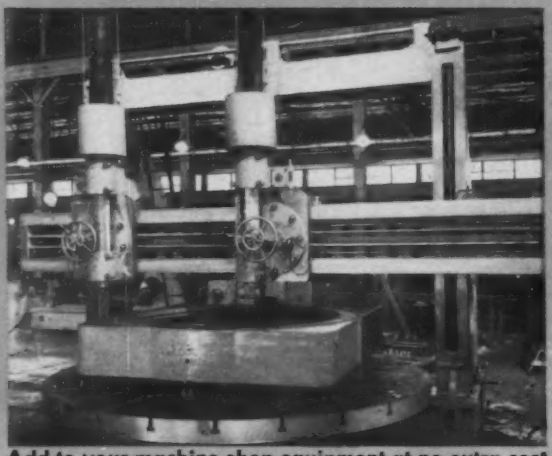
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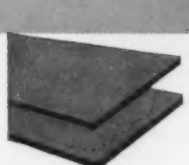
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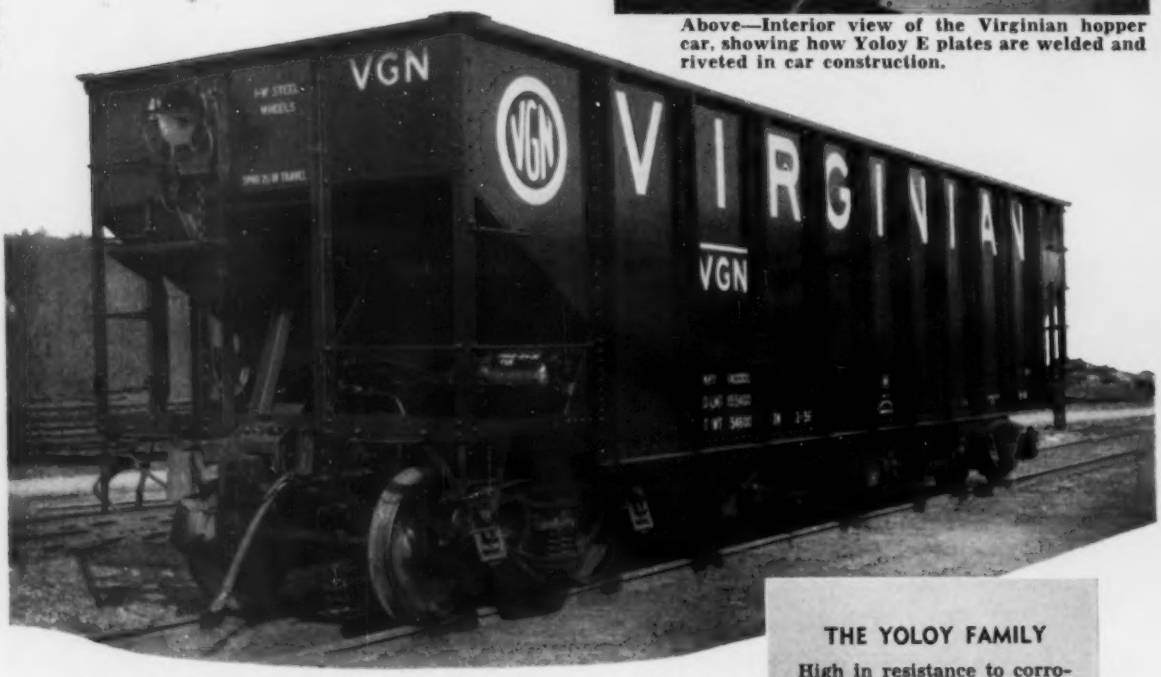
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On the Virginian coal rides on YOLOY E



Above—Interior view of the Virginian hopper car, showing how Yoloy E plates are welded and riveted in car construction.



Five hundred 70-ton hopper cars like this one, to be built in the Virginian shops this year, will use Yoloy E plates. These rugged cars will soon join fleets of thousands of others built of high strength steels, to haul the nation's coal from mines to market.

Yoloy E has high resistance to corrosion, abrasion and shock which results in lower maintenance and greatly lengthened life for hopper cars, box cars and other rolling stock.

The excellent forming and welding qualities of Yoloy E meet all requirements for railroad construction. More than 20 years of proven service on American railroads demonstrate every day the extra values obtained from the Yoloy Family of Steels.

THE YOLOY FAMILY

High in resistance to corrosion, shock and vibration, easy to fabricate, easy to weld.

YOLOY S
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High Strength Steel

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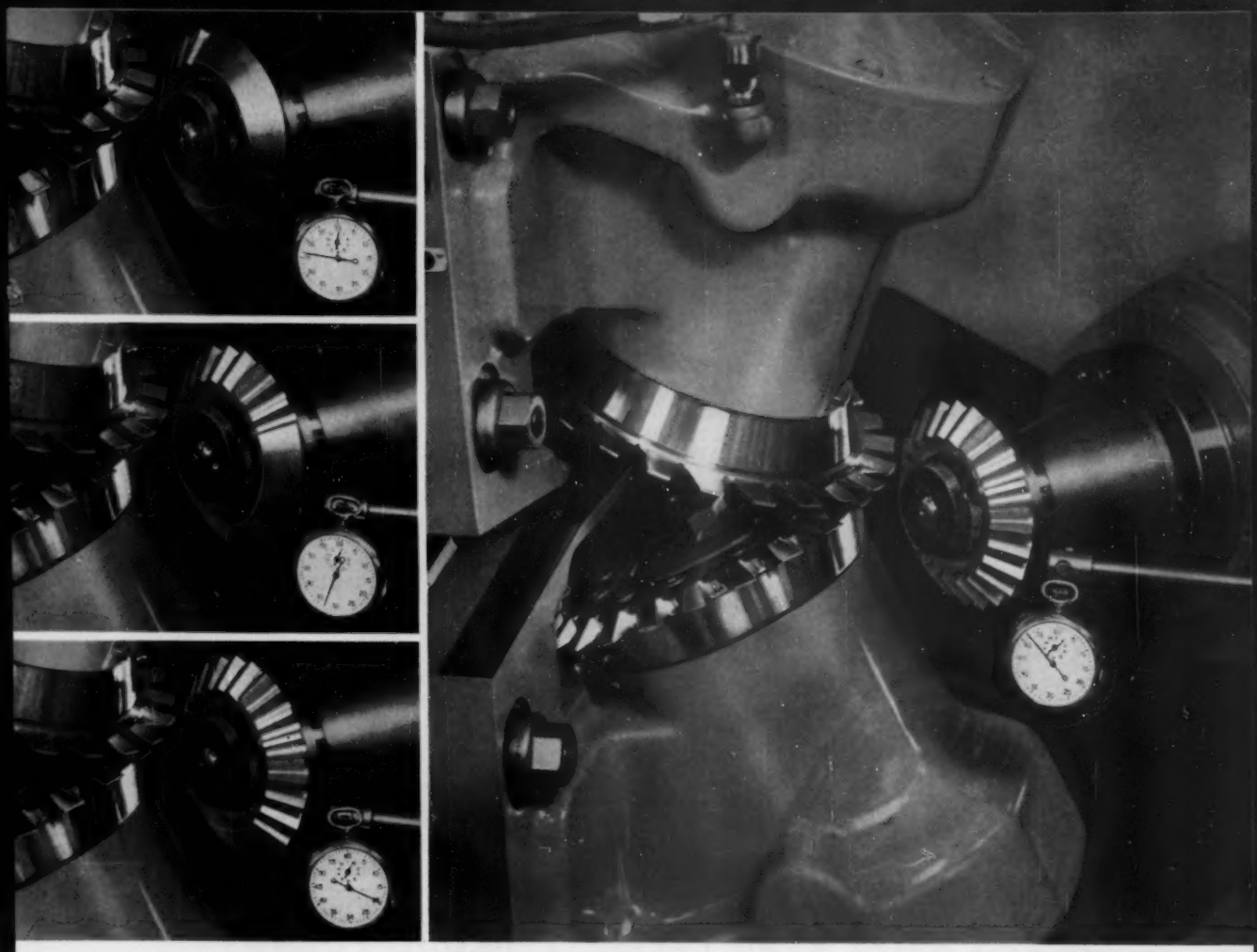
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3 minutes-52 seconds, completed from the solid

You can cut gears 5 times faster!

You can increase production by as much as 400%.

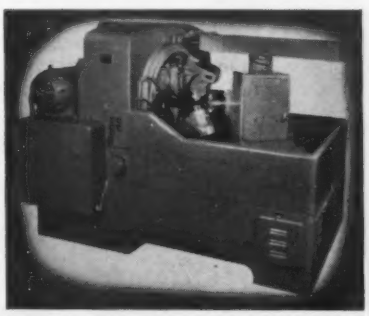
Your exact gain may vary with different gears, but in most cases this new generator will complete five gears in the time earlier models cut just one. The illustrations above show a 6 DP, 25 tooth, 7/8" face width, straight bevel gear completed from the solid blank.

The No. 104 Straight Bevel Coniflex* Generator completes each tooth in one rapid operation. A pair of multi-blade disc-type cutters combined with a cam-controlled machine cycle insures high efficiency, fine finish and maximum cutter life.

Easy to set up, the No. 104 has a wide range of capacity. You'll get the same excellent results for both small quantity jobbing work and volume production.

To discover other savings you can make with this remarkable Gleason Generator, simply write for descriptive bulletin.

*Coniflex® straight bevel gears with localized tooth bearings.



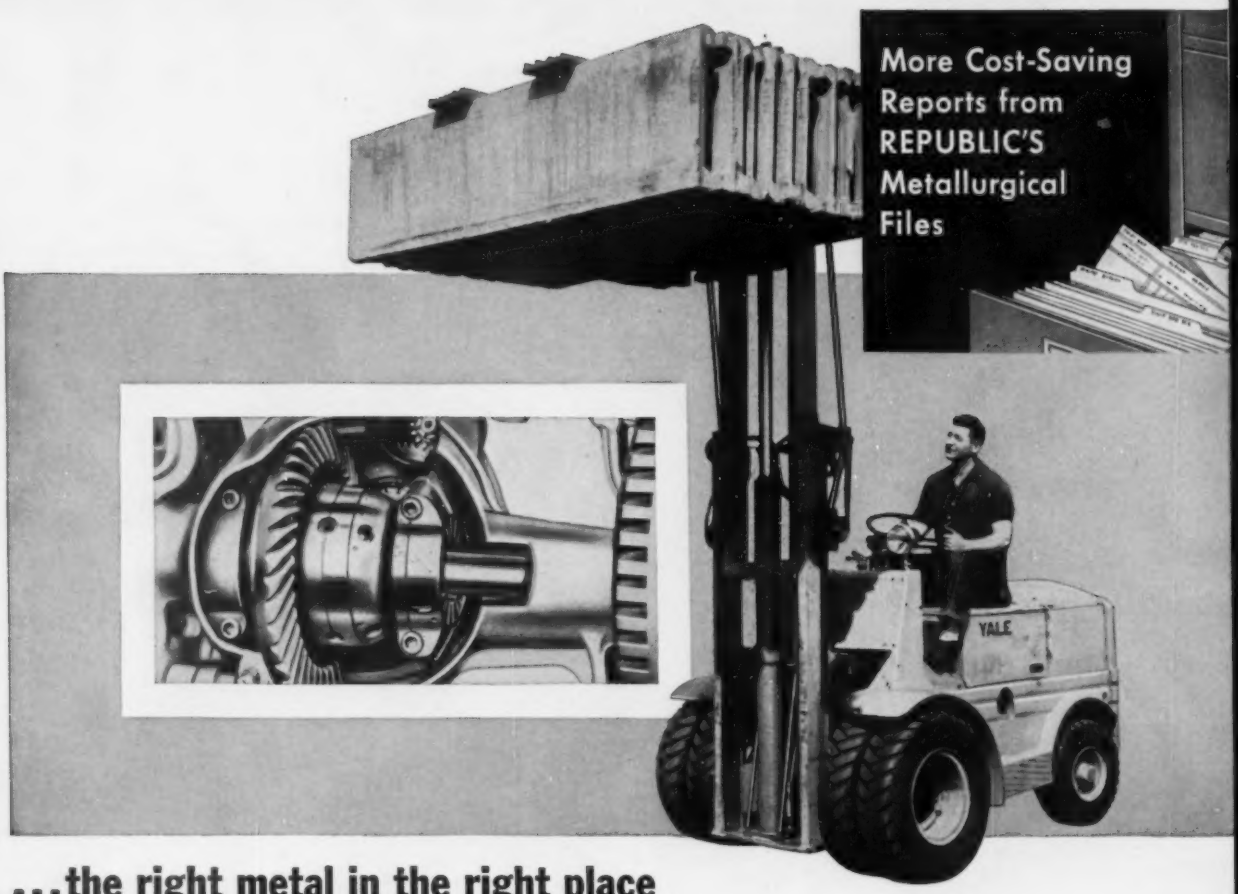
The Gleason No. 104 Straight Bevel Coniflex Generator cuts gears up to 8½" diameter, 4½" cone distance and 1⅜" face width, from 20 to 3 DP, ratios up to 10 to 1.

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HELPS RAISE LOAD CAPACITY 90,000 POUNDS

At one time, load capacity of lift trucks was restricted to the limits of elevators, usually 2,000 to 10,000 pounds, in multi-storied industrial plants. But with the present trend to one-story plants, the load limit is off.

The Yale & Towne Manufacturing Company, Yale Materials Handling Division, is building lift trucks with capacities as high as 100,000 pounds and using Republic Alloy Steels for vital areas of construction. An outstanding example is the full floating drive axle shown above. The axle, located in the front of lift truck, drives the unit and also bears the full weight of whatever is being lifted.

Prior to the use of Republic 4340 Alloy Steel, this was the part that most frequently failed in service. But, Yale & Towne engineers eliminated this problem by taking full advantage of alloy steel's superior strength and resistance to fatigue, shock and stress.

Republic Alloy Steels provide a combination of qualities essential to designing smaller sections to carry heavier loads with no sacrifice of strength or safety. You will find the highest strength values in these fine steels—plus an exceptionally high strength-to-weight ratio that permits the transmission of hundreds of horsepower through tough, strong axles, shafts and gears free from excess weight.

Add to these qualities a uniform response to heat treatment that produces hard, wear-resistant surfaces around tough cores; and you have a material that insures safety, extends equipment life, and cuts maintenance and replacement costs.

If you have a problem involving any one of these factors, Republic metallurgists and engineers are ready to assist you in the most efficient and economical application of these fine alloy steels to your product. The coupon will get things started.

REPUBLIC

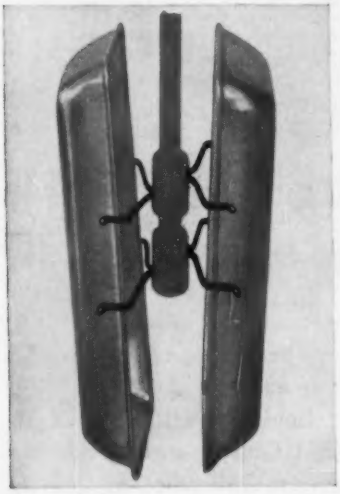
REPUBLIC STEEL

World's Widest Range of Standard Steels

Republic Titanium helps ice tray manufacturer increase anodizing rack life 100 times.

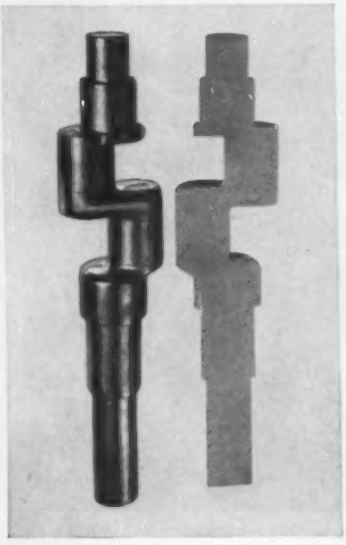


This company formerly used aluminum as rack material for anodizing ice trays and grids. But, its use was expensive and time-consuming. A considerable amount of aluminum dissolved during each anodizing and stripping cycle, and a stripping operation was required to remove anodic film formed for electrical contact on the previous cycle. Then the manufacturer switched to commercially pure Republic Titanium. The result? Rack life increased 100 times. Stripping operation eliminated. Stubborn resistance to chemical attack of cleaning, etching, brightening and anodizing solutions. Republic will help you apply Titanium to parts that must stand up to severe service. Write us.



Republic Chateaugay Pig Iron provides excellent surface, dimensional accuracy, uniform grain structure in ductile iron castings.





These two views of a shell-molded, ductile iron crankshaft show the excellent surface and the fine, uniform grain structure of the interior. Unseen is the high tensile strength, wear-resistance and top machinability provided by Chateaugay, Republic's exclusive premium Pig Iron. Chateaugay's high-carbon, low-phosphorus, copper-free content makes it ideally suited to ductile iron use. A Republic Pig Iron Metallurgist will show you, without cost or obligation, how Chateaugay consistently outperforms other pig irons. Check the coupon below if you would like a Pig Iron Metallurgist to call.

Republic Cold Drawn Special Sections cut machining costs on typewriter margin rack.



This part is produced at less cost because most of the machining has been eliminated. The manufacturer uses Republic Cold Drawn Special Sections that are preformed to the predominating cross section of the part. If you produce or design steel parts and are interested in reducing costs, you'll want to know more about these advantages of cold drawn special sections. (1) Almost limitless flexibility in design. (2) One-piece shapes replace costly assemblies. (3) Simplification of built-up, inter-locking or associated parts. (4) Benefits of cold drawing including higher strength, greater hardness, a bright, smooth finish that rarely requires further machining. Made to specification in all grades of carbon, alloy and stainless steel.



STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
Dept. C-1647
3104 East 45th Street, Cleveland 27, Ohio

Send more information on:
☐ Alloy Steels ☐ Titanium ☐ Special Sections
☐ Have a Pig Iron Metallurgist call.

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____



Jack Berger, General Foreman, Lehmann-Brandes Machine Company, St. Louis, Mo., and R. A. Loughman, Gulf Sales Engineer, watch George Mayer operate his turret lathe on Gulfcut. Gulfcut oils excel over a wide range of metal cutting applications—this firm uses Gulfcut exclusively on gear shapers, milling machines and all other machining operations, for long tool life, lower costs.

"Day in, day out, month after month, we get better results with GULFCUT"

says Jack Berger, General Foreman of Lehmann-Brandes Machine Company, St. Louis, Missouri

Lehmann-Brandes, manufacturer of engine lathes, high-speed production presses and special machinery, uses Gulfcut cutting oils because they deliver longer tool life, help reduce machining costs. And, Mr. Berger says: "Lehmann-Brandes products are precision-built. Gulfcut contributes greatly to the close-tolerance machining of components."

The complete line of Gulfcut cutting oils includes mineral-lard oils, sulfurized-mineral oils, sulfurized-mineral-lard oils, sulfo-chlorinated-lard oils and emulsifying oils. Each is scientifically compounded to meet specific needs—and the Gulfcut line includes a proper type of cutting oil *for every metal cutting need.*

Your Gulf Sales Engineer will be glad to recommend the correct Gulfcut cutting oils for you. He's at your nearest Gulf office, as close as your telephone.

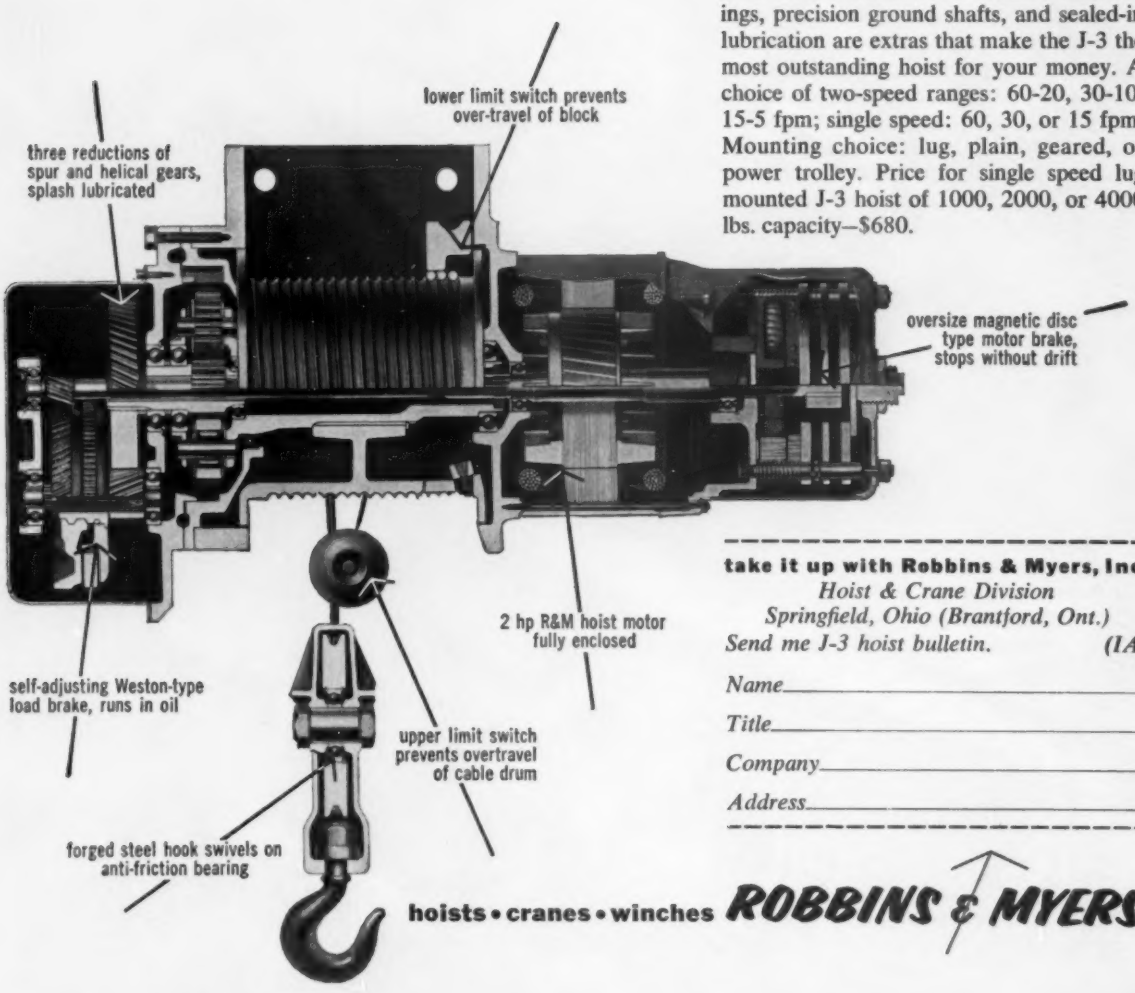
GULF OIL CORPORATION
GULF REFINING COMPANY
1822 Gulf Building
Pittsburgh 30, Pennsylvania

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS



too much hoist?

R&M J-3 hoists have specific points of superiority that go beyond what hoist users usually consider "adequate." The 2 hp R&M high torque hoist motor, designed and built for full-time, full-load hoist duty, has the highest motor rating found in any standard hoist (30 min., 55 degrees C.), giving it ample reserve for accidental overloads. Power is transmitted through three reductions of cut helical and spur gears, instead of the usual two. Oversize ball bearings, precision ground shafts, and sealed-in lubrication are extras that make the J-3 the most outstanding hoist for your money. A choice of two-speed ranges: 60-20, 30-10, 15-5 fpm; single speed: 60, 30, or 15 fpm. Mounting choice: lug, plain, geared, or power trolley. Price for single speed lug mounted J-3 hoist of 1000, 2000, or 4000 lbs. capacity—$680.



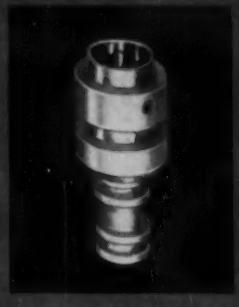
take it up with Robbins & Myers, Inc.
Hoist & Crane Division
Springfield, Ohio (Brantford, Ont.)
Send me J-3 hoist bulletin. *(IA)*

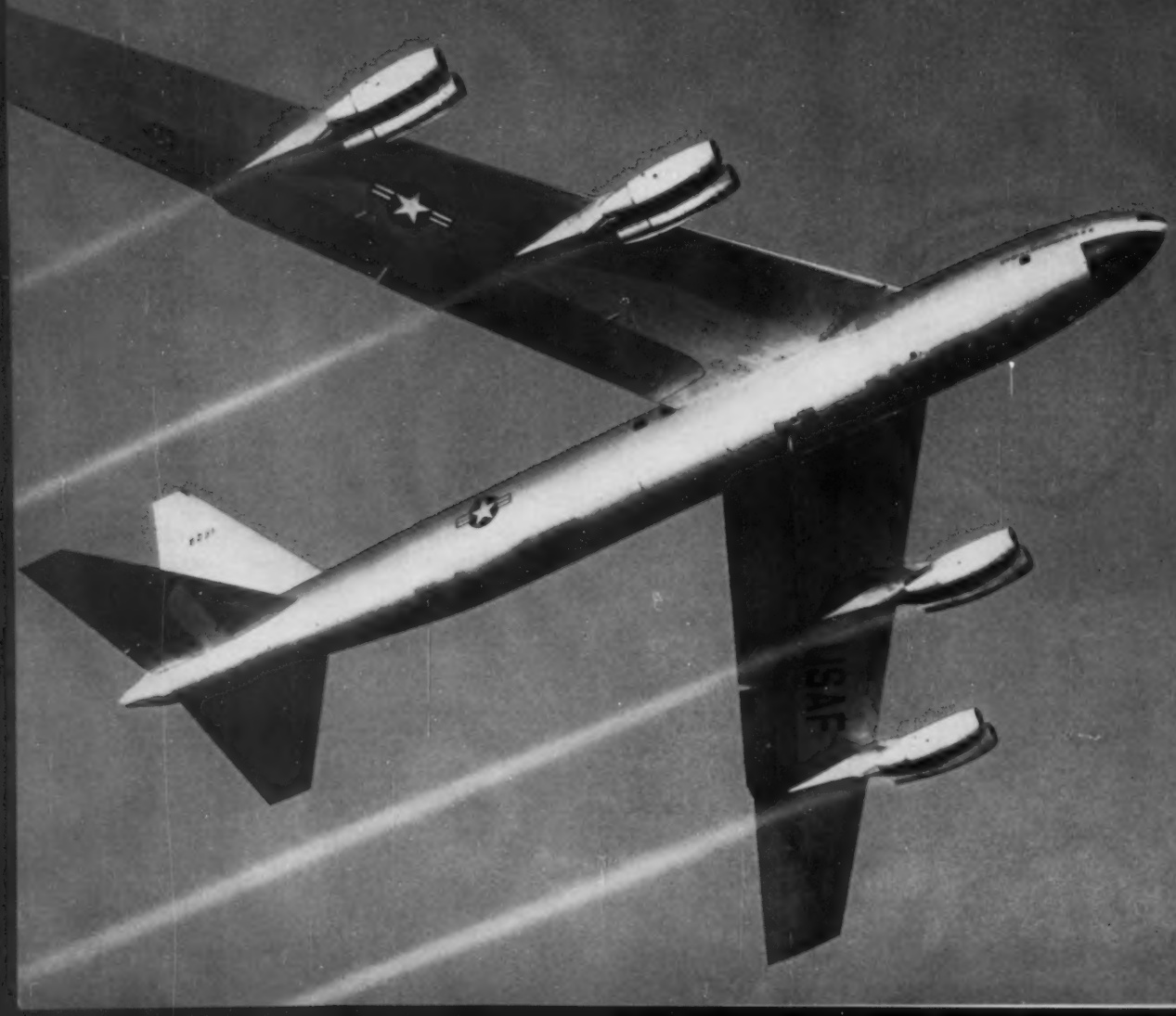
*Name*_____
*Title*_____
*Company*_____
*Address*_____

hoists • cranes • winches **ROBBINS & MYERS**

Finishes to 3 millionths







of an inch...

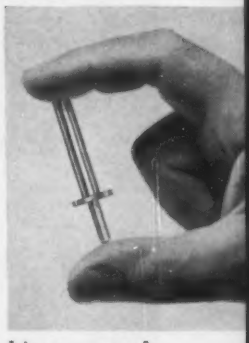
on these *Carpenter* Stainless parts which keep America's biggest jet bombers flying!







when you want *RESULTS*...



be guided by stainless fabricating performance on interesting jobs like these. Carpenter Stainless parts like these are used in the fuel control systems of America's newest and biggest planes such as the B-52 jet bomber shown at left. Finishes of 3 millionths of an inch are obtained in the machining of many highly critical stainless aircraft parts. In addition, the company who fabricates these parts for the airframe manufacturer is able to hold close tolerances on parts that are irregular in shape. In his own words "... we know we can rely on Carpenter Stainless to hold the dimensions to which the parts are designed."

when you want *ACTION*...



on delivery of the Carpenter Stainless you need, simply dial your nearest Carpenter Mill-Branch Warehouse, Office or Distributor. The man on the order desk is your link with large stocks of Carpenter Free-Machining Stainless Steels, Matched Tool and Die Steels, or Special-Purpose Alloy grades. And large local stocks are backed by Carpenter's nationwide network of Mill-Branch Warehouses. These warehouses are linked by direct, private wire service as further assurance that the specific grade you want is available when you want it. Call the Carpenter location nearest your plant for service you can rely upon.

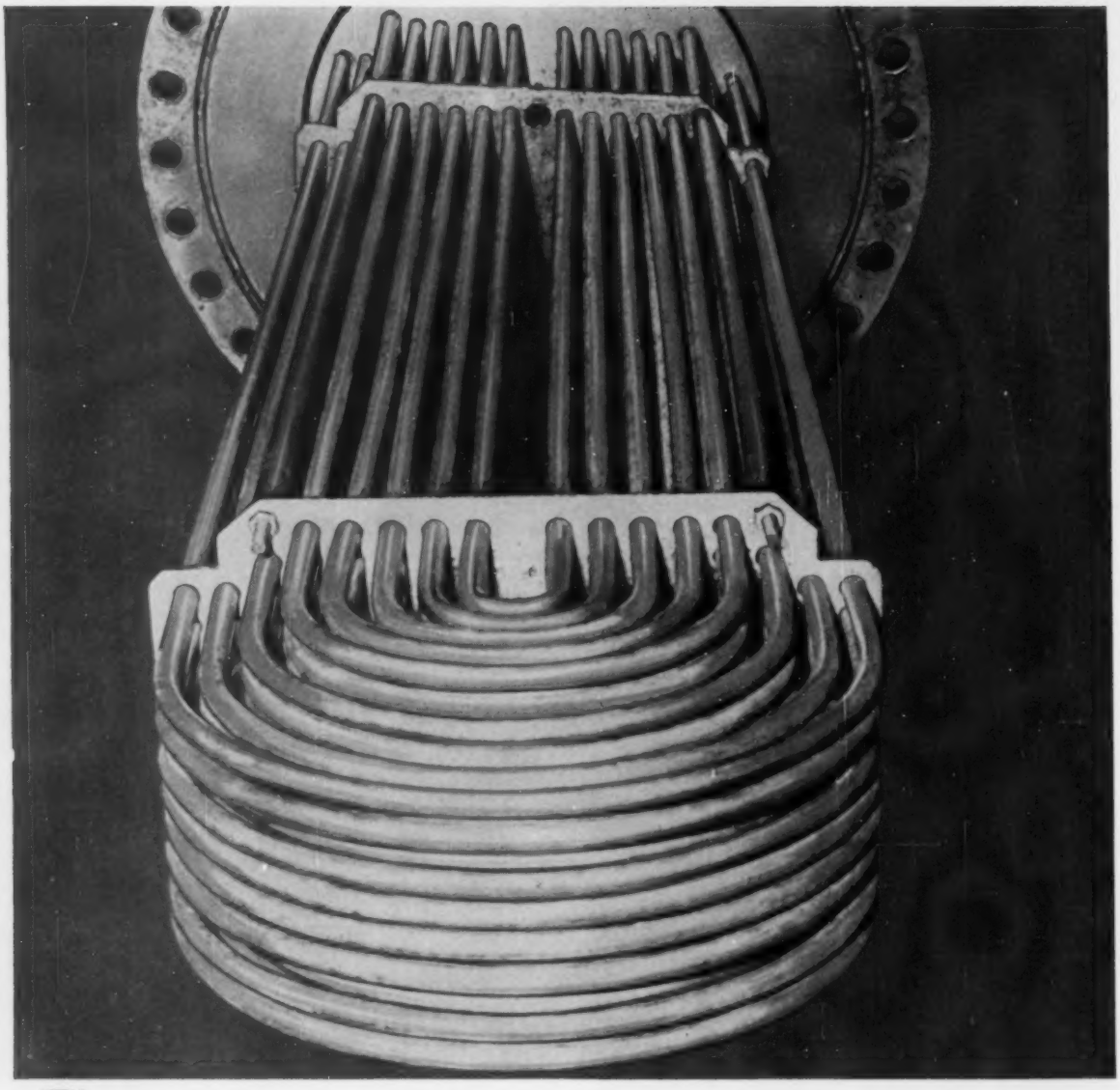
Carpenter STEEL

Free-Machining Stainless Steels

The Carpenter Steel Company, 121 W. Bern St., Reading, Pa.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Mill-Branch Warehouses, Offices and Distributors in Principal U. S. Cities



Carpenter Stainless No. 20Cb Tubing withstands Tortuous Fabrication and Service

Note the tortuous hairpin bends in this tube bundle used in a large oil refinery to handle concentrated H_2SO_4 at temperatures from 175-194°F, and pressures from 300-400 psi. Whenever and wherever *you* design or use equipment that handles severe corrodents, check the service-proved cost-saving results you can expect with Carpenter Stainless No. 20 and No. 20Cb. Ask your Carpenter Distributor about these super stainless alloys available in tubing, pipe, sheet, plate, bars, wire, strip and billets.

MEMBER

The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"

Carpenter

more than corrosion resistance

Stainless Tubing & Pipe

Carpenter No. 20 bars, strip, wire and billets are available also from The Carpenter Steel Company, Reading, Pa.

heavy press extrusions



Heavy Press Extrusions now in Production

New 8000 ton press now permits greatest design flexibility. Wide, integrally stiffened skin panels . . . solid, hollow, and stepped extrusions . . . extra large complex shapes . . . can now be obtained from Harvey in all aluminum alloys and in heat-treated lengths up to 80 feet.

New 8000 Ton Extrusion Press at Harvey Aluminum

This giant press, installed at Harvey's Torrance, California facility under the USAF Heavy Press Program, is now producing unusually large and complex aluminum alloy extrusions. These big one-piece structural shapes reduce weight and fabrication costs, make conventional methods of joining smaller components obsolete. And Harvey's completely integrated plant includes the newest supporting and finishing equipment. For the most advanced heavy press extrusions . . . *plus* Harvey's traditional high quality and service . . . contact your Harvey Field Engineer.

Harvey is a leading independent producer of quality aluminum products in all alloys and sizes: Rod and bar, pipe, tube, hollow sections, press forgings, forging stock, impact extrusions, structurals, special shapes, extrusions, screw machine products and other aluminum products. Harvey is also producing similar items in titanium and steel.

Making the most of aluminum . . . for everyone

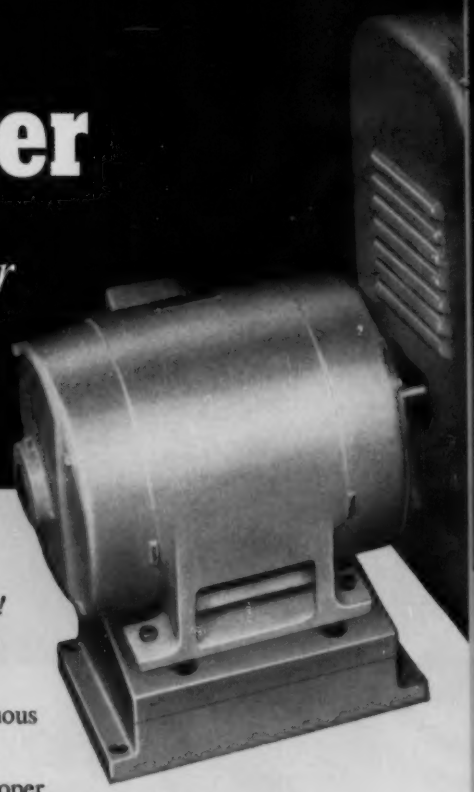
HARVEY Aluminum

Harvey Aluminum Sales, Inc.
Torrance, California
Branch Offices in Principal Cities

Now Available from Le Blond...

No. 30 Rapid Borer

to Bore Holes Faster than Ever Before



With the new LeBlond-Carlstedt Rapid Borer, you can bore, trepan or counterbore holes *3 to 8 times faster than by the conventional D-bit method!*

The Rapid Borer was developed expressly to accommodate revolutionary new tooling which cuts at very high speed with good accuracy and finish. Cutting oil is forced between the boring bar and hole wall forming a continuous bearing. It flushes back through a hole in the boring head and bar, carrying away the chips as it goes. Chip form is controlled both by tool angles and proper feed and speed combinations; thus tool faces are kept clean and chip passage clear. Cutter design produces balanced cutting pressures thereby controlling concentricity.

This new tooling requires a machine with the following characteristics, all of which are incorporated in the LeBlond Rapid Borer design:

High spindle horsepower
Ample rigidity throughout
Complete absence of vibration at all speeds
Infinitely-variable feeds (up to 38" per minute), independent of speeds, while running under load
Final drive to spindle through belts
Large volume of cutting oil

Basically, the Rapid Borer is suited to work that is symmetrical for balance in rotation—round, square, octagonal, tapered or stepped. A wide variety of hole diameters and depths as well as work sizes can be accommodated.

Tell us about the holes you'd like to produce faster. Large holes or small. If the Rapid Borer can handle the job, we'll show you how to produce them faster than ever before.



BRIEF SPECIFICATIONS, No. 30 RAPID BORER

Workpiece diameter	¾″ to 6 11/16″	Trepanning or counterboring	2⅜″ max.
Boring and workpiece lengths (max.)	18″, 42″ or 66″	Spindle speeds	Single speed or variable to 2500 rpm
Solid boring	½″ to 1¼″	Main drive motor	30 hp

EXAMPLES OF WORK BORED IN OUR SHOP

1. Drive Shaft, 29½″ x 2⅜″
Blind hole, 25″ deep, .887″ dia.
Material, 4140
Penetration rate, 6¼″/min.
Floor-to-floor, 5.5 minutes
Old method* floor-to-floor, 29.2 min.

2. Barstock, 13⅛″ x 2⅝″
Through hole, 1.062″ dia.
Material, C1141
Penetration rate, 7¼″/min.
Floor-to-floor, 3.2 min.
Old method* floor-to-floor, 19.4 min.

3. Barstock, 10 13/16″ x 2⅛″
Through hole, .775″ dia.
Material, C1141
Penetration rate, 7″/min.
Floor-to-floor, 3.03 min.
Old method* floor-to-floor, 14 min.

** Old method—conventional D-bit*

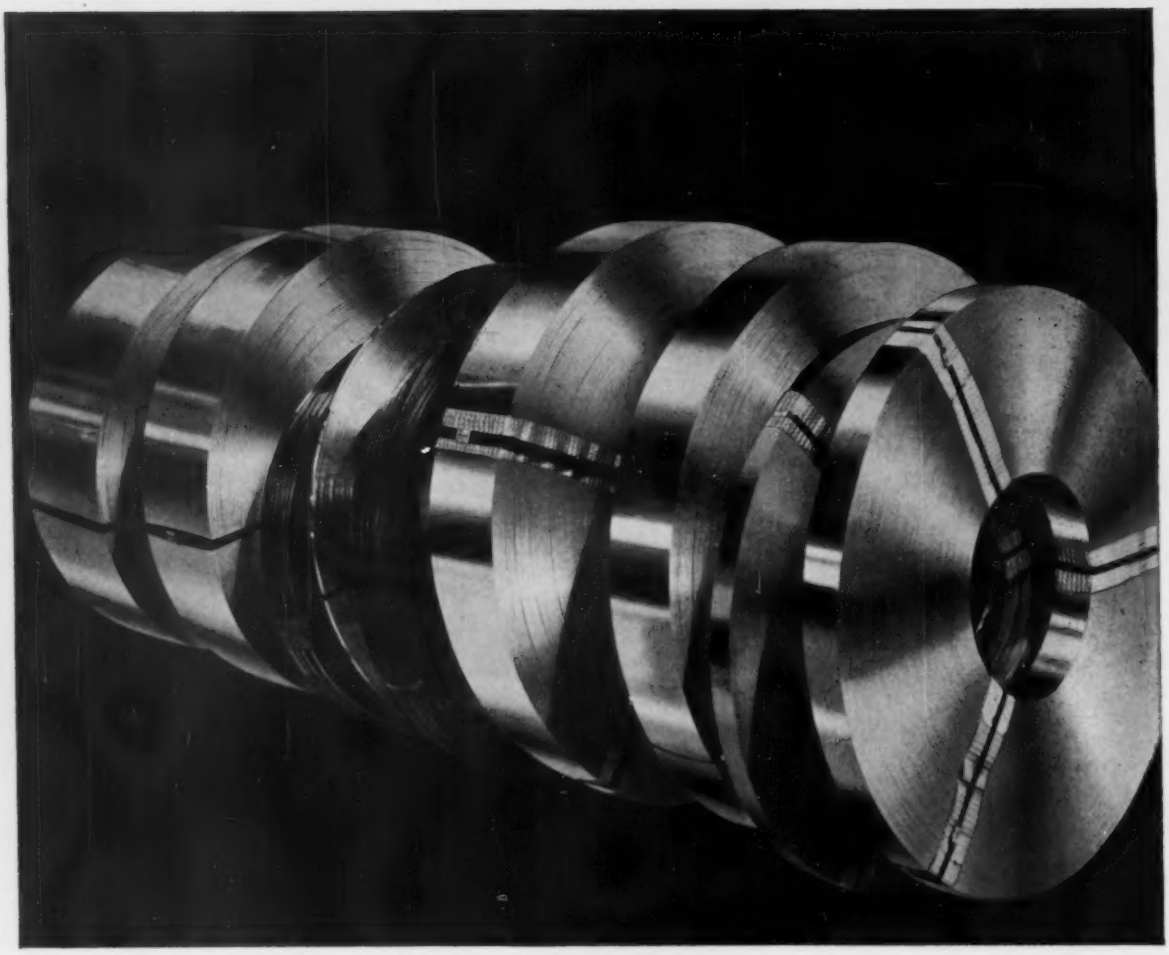
...cut with confidence

The R. K. LeBlond Machine Tool Company

Cincinnati 8, Ohio

World's Largest Builder of a Complete Line of Lathes for more than 69 Years

LeBLOND of Cincinnati



it's CRUCIBLE for the widest assortment of cold rolled specialty steels

Crucible has the largest assortment of cold rolled specialty steels you'll find anywhere. And delivery is dependable—in the size, grade, gauge, or analysis you want.

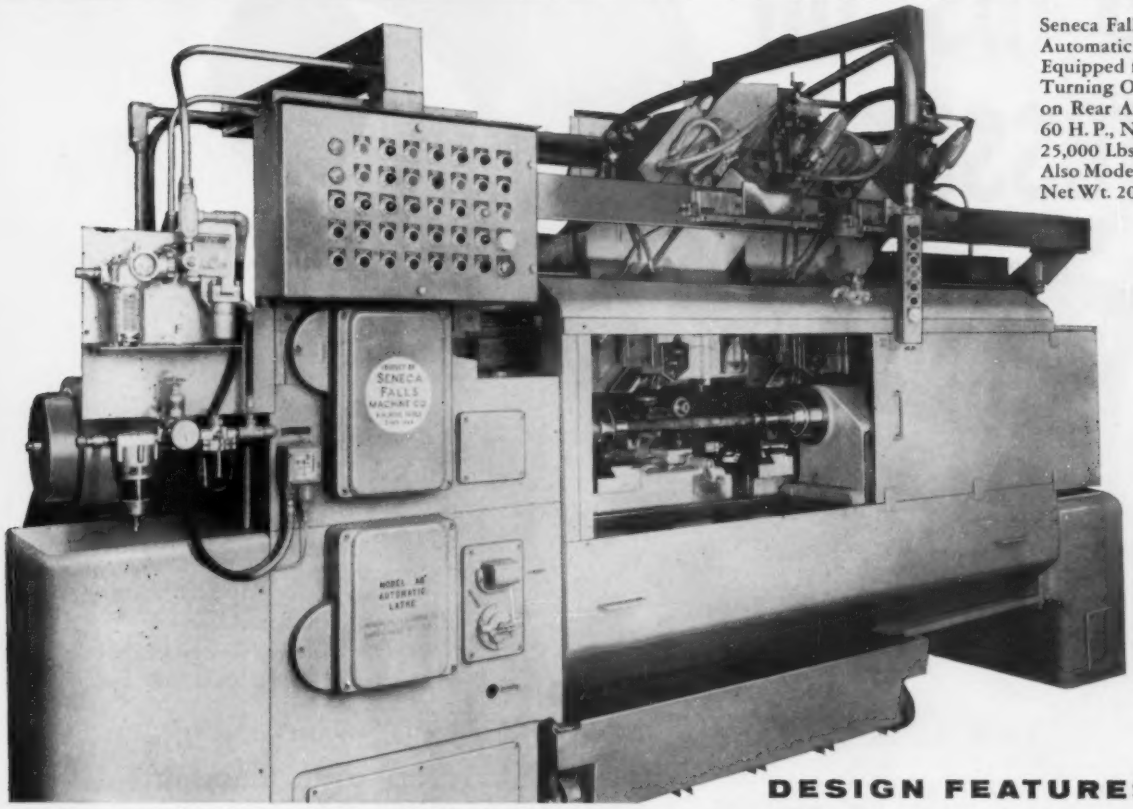
What's more, Crucible's steelmaking experience—its improved mill facilities—combine to bring you cold rolled steels of optimum uniformity... finer finish ... better edges ... flatter strip.

No need to shop around—call Crucible for carbon spring steel, alloy strip steel, or *any* ferrous analysis that can be cold rolled. For more information, write now for your copy of the 32-page booklet, "Cold Rolled Specialty Steels". *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

A BETTER METHOD OF MACHINING REAR AXLE, AND OTHER SHAFTS



Seneca Falls Model AQ Automatic Lathe Equipped for Stem End Turning Operation on Rear Axle Shaft. 60 H. P., Net Wt. 25,000 Lbs. Also Model LQ, 30 H.P., Net Wt. 20,000 Lbs.

● The new Models LQ and AQ Seneca Falls Automatic Lathes are designed to combine the best and fastest methods of rough and finish turning shafts on a single machine without removing the work and without attention on the operator's part.

The line drawing shows a machining operation on the stem end of a rear axle shaft which is rough turned with multiple tools on a rear carriage while finish turning is done with single, tracer-controlled tools on each of the two overarm carriages. Thus the advantages of multiple tooling for stock removal and single tool tracer turning for accurate finish operations are combined. By this method extremely close tolerances are maintained since the pressure of the single tool is constant over the entire length of the work piece, and full advantage can be taken of the higher cutting speeds now possible with the newer carbide and oxide tool materials.

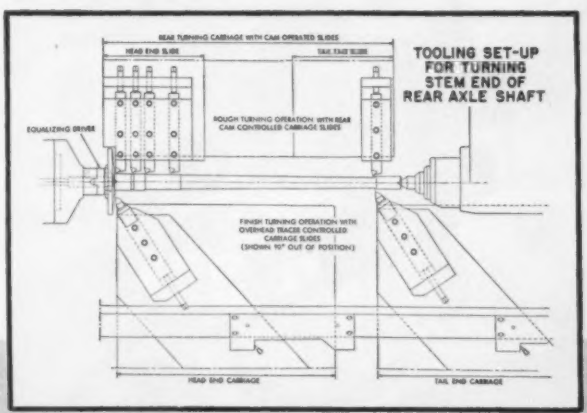
The machining operation is completely automatic . . . the operator loads shafts between centers and pushes the starting button; multiple tools rough turn; tracer tools then finish turn; and finally the machine stops with all tools returned to starting position.

A similar type lathe is used for the flange turning operation. Varying application of multiple tooling or single tracers to either rear or overarm carriages is possible on these lathes and complete "in line" automation can be engineered to specific production requirements,

Seneca Falls Machine Co., Seneca Falls, N. Y. Write for Bulletin Q-56-F

DESIGN FEATURES

- ▶ **Simplified changeover features for reduced set-up time.**
- ▶ **Feed rate may be automatically changed during cutting cycle.**
- ▶ **Streamline design for efficient chip guarding.**
- ▶ **Screw feed to all carriages.**
- ▶ **Four speed head with automatic change-over.**
- ▶ **Large chip flow area.**
- ▶ **All templates clear of chip area.**
- ▶ **All ways hardened, ground and replaceable.**
- ▶ **Open front design facilitates loading and unloading.**
- ▶ **Straight line diameter adjustment for tracer tools . . . no shoulder length change to correct.**



NEW SENECA FALLS

MODEL LQ AND AQ AUTOMATIC LATHES

50 lbs. oil pressure

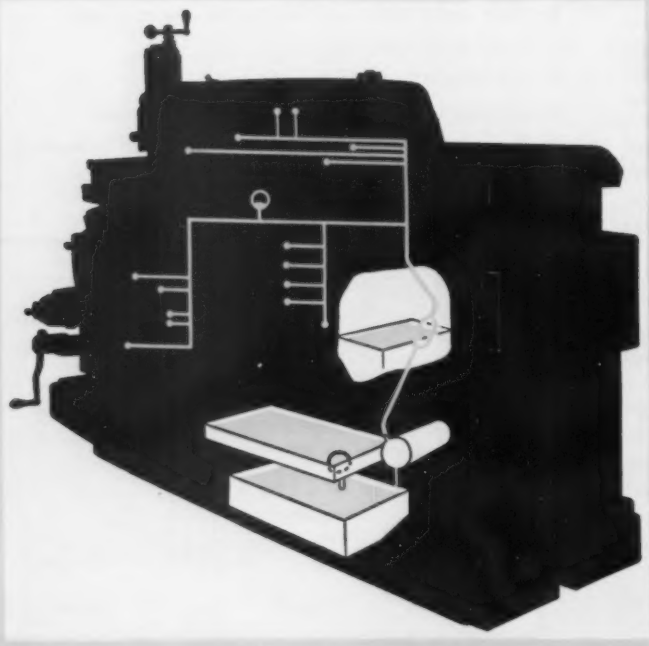
IS NECESSARY WITH A CUT LIKE THIS...



Demonstration cut on Cincinnati Rigid Shaper.
Actual size steel chip, 2" cut, .030" feed.

This tremendous cut demonstrates the ability of the 50 p.s.i. lubrication system to develop and maintain oil films under the heaviest loads.

It also demonstrates the strength, rigidity and power which are standard features on all Cincinnati Rigid Shapers.





Write for Bulletin "Cincinnati Rigid Shapers"

50 p.s.i. system includes 50 micro filter, settling basin and reservoir. Transmission runs submerged in oil.

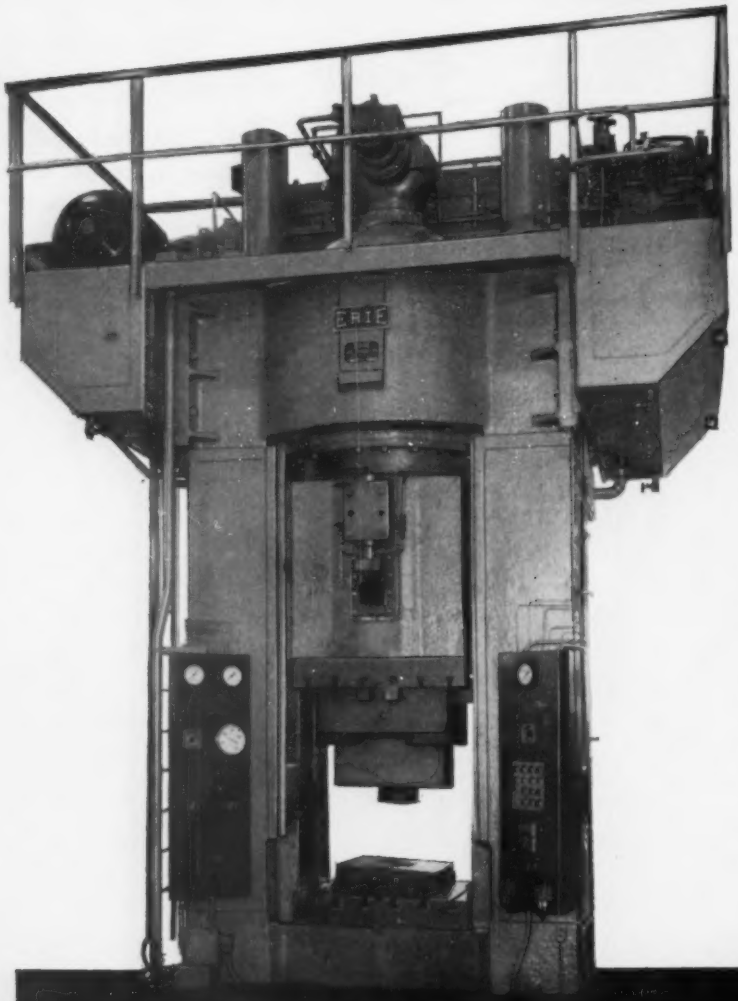
The Electro-Magnetic Brake and Clutch with finger tip control are standard features on Cincinnati Shapers for maximum speed and ease of operation. ☆



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI



ELECTRO-MAGNETIC CONTROL

All controls are grouped on one accessible control panel which allows delicate finger-tip control by the operator . . . the machine responds *instantly*. This control allows any speed of ram travel in either direction.

SEMI-AUTOMATIC OPERATION

The forging cycle can be pre-set to incorporate any speed and tonnage—advance, press, slow return, fast return.

REMOTE MANUAL CONTROL

Manual control is easily detached from the control panel by the operator who is free to control the press from any nearby position.

HYDRAULIC TOP & BOTTOM STRIPPERS

Can be set to eject the forging from the die at *any* position.

NEW ADJUSTABLE GUIDES

Insure accurate platen alignment and *requires no shimming*. Adjustment can be made in less than an hour.

ERIE FOUNDRY'S NEW HYDRAULIC PRESS

with electro-magnetic control

produces precision forgings

1500-TON FORGING PRESS

platen size:	48" x 48"
opening:	60"
stroke:	48"
speeds—advance:	400" per minute
press:	adjustable from 0" to 52" per minute
slow return:	adjustable from 0" to 52" per minute
fast return:	360" per minute
hydraulic components:	Oilgear with Raytheon Servo-control

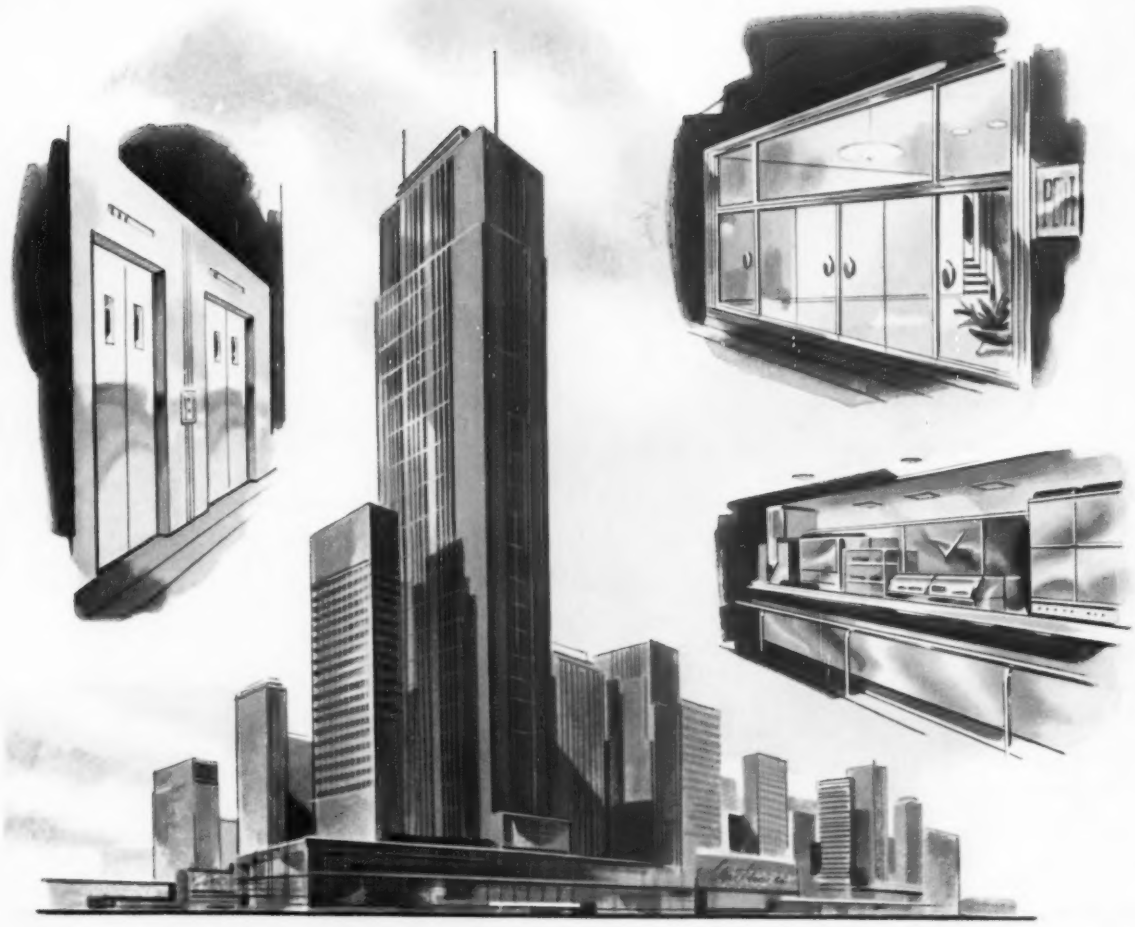
The Erie Foundry Hydraulic Forging Press was specially designed for no-draft non-ferrous forging. Modifications of this rigidly built, self-contained machine can be supplied to your forging requirements. For more information, please write.

ERIE

Hydraulic Press Division

ERIE FOUNDRY CO.
ERIE, PA.

GREATEST NAME IN FORGING MACHINERY SINCE 1895



in buildings...
everybody benefits from **stainless steel**

the architect specifies long-lasting Stainless Steel for its strength, its beauty and its economy of maintenance. In heavy use areas and for weather-exposed panels and trim, nothing stands up or keeps its smooth finish like Stainless Steel.

the builder likes working with Stainless Steel. It is easy to install, does not dent, peel or discolor and presents no problem on matching or replacement.

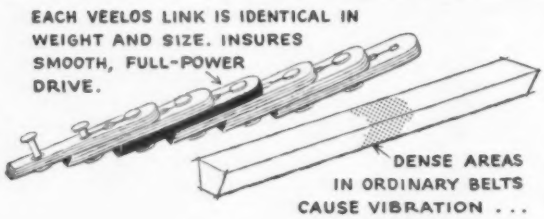
the tenants enjoy living or working in buildings that are bright, clean and attractive because of Stainless Steel.

McLOUTH STAINLESS STEEL

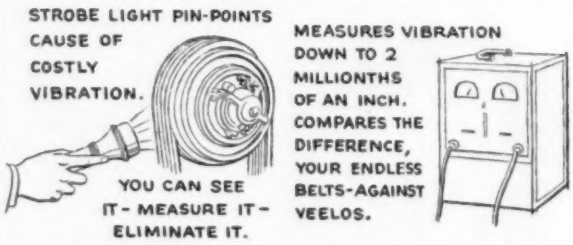
For the product you make today and the product you plan for tomorrow specify McLouth high quality sheet and strip Stainless Steel

McLOUTH STEEL CORPORATION DETROIT, MICHIGAN • MANUFACTURERS OF STAINLESS AND CARBON STEELS

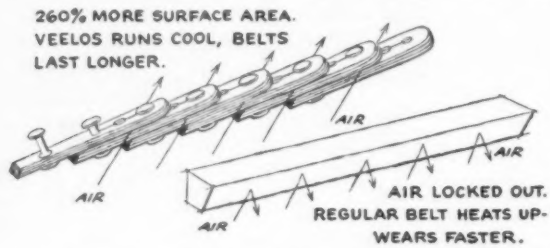
Six Reasons Why Veelos Adjustable V-Belts Are Better For Your Drives!



1. Balanced construction of Veelos Belts assures you faster, cleaner work, less rejects . . . less bearing wear. Each link and stud is identical in size and weight. Ordinary belts have varying spots of density which cause excess vibration—chatter marks, machine wear.



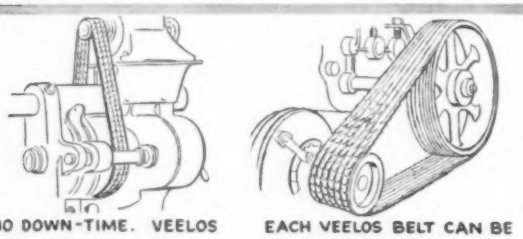
2. Electronic proof—up to 90% less vibration! With a vibration analyzer, you see, on your own machine, how Veelos belts decrease vibration up to 90% over any belt you're now using. This amazing Veelos test pin-points the belt that has the "invisible shakes."



3. Cooler running—long life! Veelos breathes! Constant circulation of air keeps Veelos running smooth. Regular V-belts have no chance to cool, heat builds up from the inside . . . causes slippage, wastes power, heats bearings, reduces belt life.



4. Greater flexibility reduces slippage! Sectional construction, beveled links allow greater flexibility, longer belt life. Each link moves around sheave independently and maintains full contact, constantly. Full area contact allows shorter centers, smaller sheaves.



5. Simple installation "knocks out" down-time! Saves up to 50% installation time on outboard bearing drives, more when belt length isn't in stock. No resetting, tilting or moving motors. Veelos can be made any length, can be changed by adding or removing links.



6. Veelos won't stretch any more than ordinary endless V-belts when it is properly installed. *Remember—measure Veelos 1" short per foot and roll on drive as tightly as possible.* With the first few revolutions Veelos studs accept a permanent set into the sections they connect.

4 TYPES — FOR ALL DRIVES



VEELOS
THE BALANCED LINK V-BELT

Known as Veelink outside U.S.A.

For all sizes and types of drives. Double-V available for serpentine drives.

Write for free Veelos Data Book or Veelos Vibration Demonstration to:

MANHEIM
Manufacturing & Belting Co.
408 Stiegel St., Manheim, Pa.



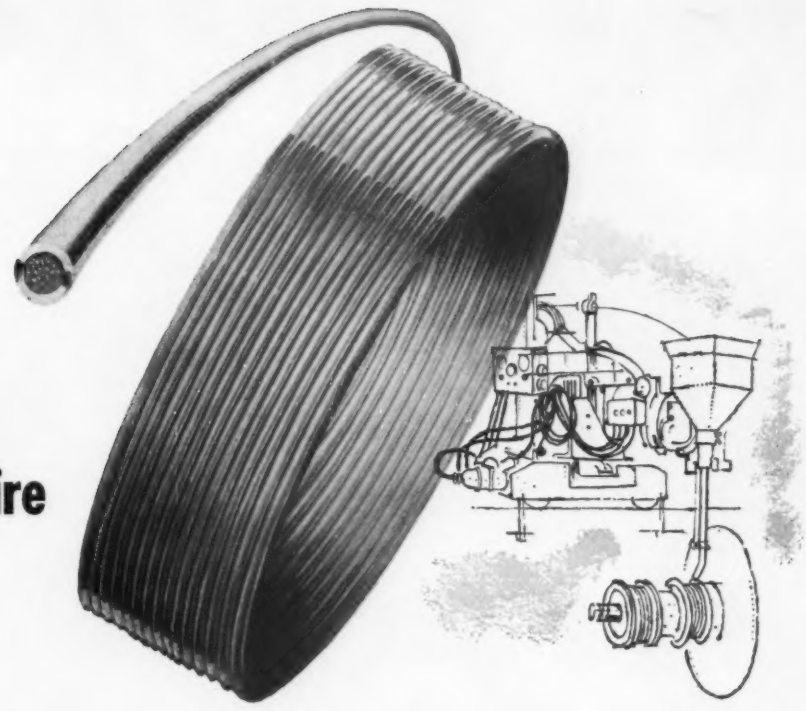
"Industrial Belt Specialists Since 1911"

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HAYNES
Trade-Mark

Drawn Tube Wire

for . . .



TROUBLE-FREE MECHANIZED HARD-FACING

HAYNES drawn tube wire is an important innovation in the hard-facing field and is designed to make automatic and semi-automatic deposition even more practical. It successfully combines the uniformity of composition and the economy offered by tube rod, with the ease of application of solid welding wire. In addition, standard wire tolerances for roundness and concentricity are strictly adhered to in order to insure trouble-free application. HAYNES drawn tube wire feeds smoothly and uniformly in any standard welding machine without the aid of special adaptors. Kinks and twists which sometimes hamper tube rod deposition are minimized. Deposits of this newly developed product are dense and sound.

Coils of drawn tube wire are now available in the following alloys: HAYNES 90, HAYNES 93, HAYNES 4560, HAYNES 5260, HASCROME, and HAYNES Nickel-Manganese. The variety of properties offered by these iron-base alloys insures a solution to a great many wear problems encountered in practically every industry and especially in the mining and construction fields. Drawn tube wire comes in 3/16 inch diameters only.

For more information on the complete line of HAYNES tube rods in coils or on any of the 19 HAYNES hard-facing alloys, write to any of the district offices listed below.

HAYNES
TRADE-MARK
ALLOYS

HAYNES STELLITE COMPANY

A Division of Union Carbide and Carbon Corporation

UCC

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ONLY Allis-Chalmers



ALLIS-

MOTORS are "double protected"

New Integrated Field Coils Plus *Silco-Flex* Stator Insulation Provide Superior Motor Protection... Under Any Operating Conditions

1

Integrated Field Coils are bonded in heat-stabilized resins, enclosed in a resin-impregnated sheath of oriented glass fibers and bond-locked on the pole structure . . . dimensionally stable to withstand heating and thermal shock, vibration and fatigue at elevated temperatures . . . sealed throughout against atmospheric contaminants and fully protected against destructive forces.

2

***Silco-Flex* Insulation** provides a homogeneous, void-free insulating wall of silicone rubber on stator coils. It is unexcelled in life and thermal stability at high temperatures . . . resistant to most chemicals, water, weather . . . outstanding in flexibility and resilience . . . able to withstand abrasion and corona . . . resistant to physical and mechanical forces.



Exclusive Allis-Chalmers "double protection" is available on large electrical machines with operating temperatures through Class B range.

Silco-Flex is an Allis-Chalmers trademark.

For more information on these quality insulation systems contact your nearby A-C office, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin for Integrated Field Coil Bulletin 05R8525 and *Silco-Flex* Insulation Bulletin 05R8341.

Allis-Chalmers "Double Protection," with integrated field coils and Silco-Flex stator coil insulation, adapts this 600-hp, 2300-volt, 600-rpm synchronous motor to the most severe operating conditions.

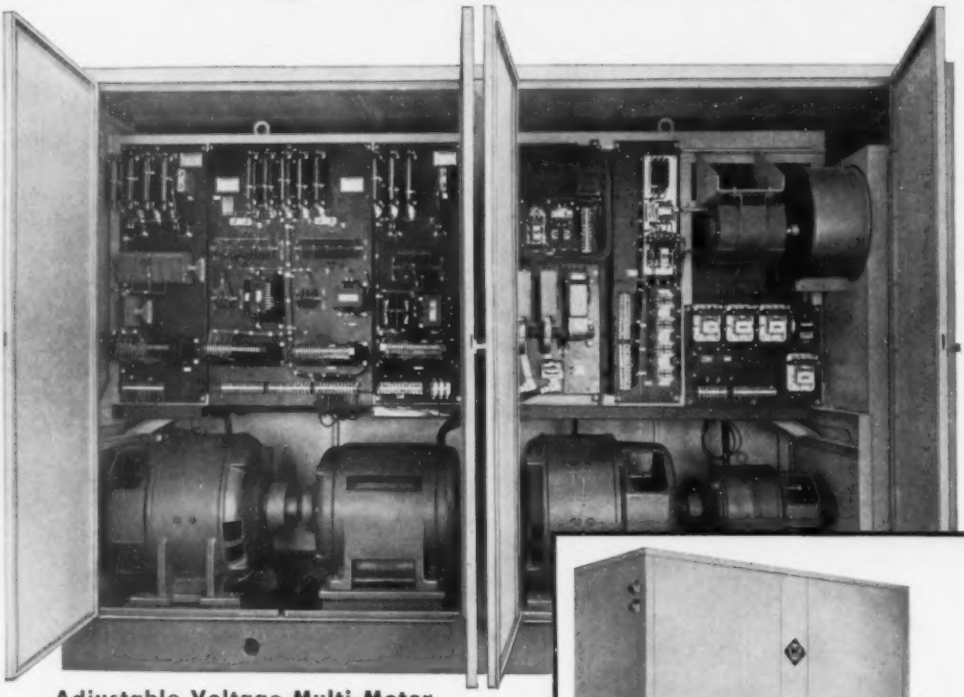
CHALMERS

A-C ALLIS-CHALMERS

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There's MORE dependable speed control

- high response
- high shock resistance
- no fragile parts
- no maintenance



Adjustable Voltage Multi-Motor Package Drive used with heat flattening and coating equipment. Unit features magnetic amplifier control of tension and strip speed.



Size 3 Adjustable Voltage Power Unit rated 30 hp, of standard construction. Magnetic amplifier excitation provided.

Every one of the design features of the Allis-Chalmers Adjustable Voltage Package Drive assures you an easy, dependable means of power conversion.

Key to Package Drive dependability is the use of a magnetic amplifier to excite the field of the power unit m-g set. Sturdy and simple, this amplifier has no moving parts to wear out . . . no fragile components to be affected by vibrations. AND — there's no wasteful "warm-up" time needed. At the turn of a dial, you get immediate speed control.

Cost-saving assembly

M-g set and control components are assembled in the power unit enclosure at the factory — saving you installation costs. Enclosures used for 30 through 200-hp units are completely collapsible and may be easily disassembled without loss of rigidity. Larger units have separately driven blowers to provide positive ventilation and pressure even when unit is idle.

Available in units from 5 to 200 hp, the package drive is ideal for any application requiring adjustable speed. Contact your nearby Allis-Chalmers sales office or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

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Which package is best for you?

ROEBLING HIGH CARBON WIRE is packaged in many ways... and for every kind of usage there's one particular type of packaging that will bring top handling and production efficiency... new economy in your plant. For certain wires, Roebling's new large-size reels or new disposable spoolless cores have special money-saving advantages:

The large reels are ideal for long runs. They reduce down time to a minimum.

The new spoolless core (a hollow fibre core without flanges) abolishes the storing and return of empty spools ... eliminates charges for spools and waiting for credits.

You *pay* for the best when you buy high carbon wire. Make sure you *get* it in wire and packaging. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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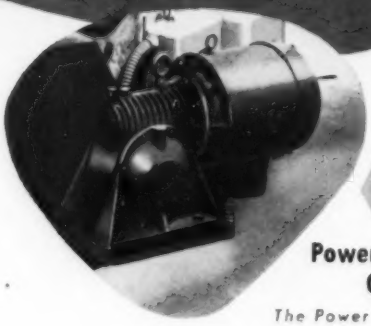
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here's why!

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2. Furnished complete for leg-out or leg-in angle bending . . *no extras to buy!*
3. Quick roll adjustment for width of slot . . quicker change-over.
4. Special roll combinations available for beams, channels, flats, pipe, etc.
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Power Adjustment Optional

The Power Adjustment of the Movable Roll Shaft is an optional extra. It is used for quickly changing roll centers for different diameters. Machines also may be equipped with Electric Brake on the main driving motor for greater accuracy of bending.

Bulletin 314-A contains complete specifications and capacities covering the four sizes and two styles. Write.

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THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.



Want to streamline your wire buying?

Call American Steel & Wire!

Have you been bogged down with paper work lately, thereby missing a chance to save money by streamlining your wire buying?

Your American Steel & Wire representative can be of immense help if you give him a call. For example, he may be able to suggest more economical buying units or packaging specifications, or find one type of wire that will do the job of two. Turn him loose in the plant, because he might find a lower cost way of doing the job —with a better product the result.

At AS&W, we *use* a lot of wire in our own plants, and have learned many little tricks that are yours for the asking. Just call your American Steel & Wire representative.

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN MANUFACTURERS WIRE

USS

AMERFINE—*high quality fine wire.*
AMERSPRING—*music steel spring wire.*
AMERTEMP—*heavy-duty oil-tempered wire.*
AMERLOY—*alloy heading wire.*
AMERHEAD—*uniform heading wire.*
AMERSTITCH—*extra-tough metal stitching wire.*

UNITED STATES STEEL

6 good questions about aluminum MACHINING

...and 6 good answers by Kaiser Aluminum Distributors

If you have a problem in machining aluminum, the chances are your *Kaiser Aluminum Distributor* can help you solve it. He has metal know-how and experience with many fabricating operations. Use his fund of technical knowledge, backed by the engineering ability of Kaiser Aluminum's field staff.

Here are the answers given by Kaiser Aluminum Distributors on specific machining questions asked by fabricators in various parts of the country. Questions such as these may also be bothering you.

Q. What is the recommended tooth spacing for band and hack saws for use in sawing aluminum?

A. In band saws, a tooth spacing of 4 to the inch is best for heavy sections. This allows ample room for chips without clogging or binding. Finer tooth spacing, up to 14 per inch, is recommended for thin stock. For hack saws, wavy set blades with about 5 to 15 teeth per inch are used extensively in cutting aluminum. For fine work, blades with much finer teeth can be employed.

Q. What are the best types of abrasives for grinding aluminum?

A. A free cutting silicon carbide in a flexible base is generally preferred. Aluminum oxide is not recommended except in certain abrasive belt applications and cutoff wheels. The wheels of medium hardness of about 30 grit in a synthetic resin bond have been found to work most successfully in roughing work. For finishing, a finer grit, up to about 54, in a vitrified bond is popular.

Q. Which aluminum alloy has the best machining qualities for automatic screw machine operations?

A. Various aluminum alloys can be easily worked on automatic screw machines. The principal alloys for such use are 2011-T3, 2017-T4, 2024-T4 and 6061-T6. Of these alloys, 2011-T3 is considered to have the best machining qualities. This general purpose alloy is specifically made for a broad range of screw machine products.

Q. What are recommended top rake angles for the common screw machine grades of aluminum?

A. The recommended top rake angle for screw machine form tools when machining 2011-T3 aluminum alloy is 0° to 3°. This angle is best also for breakage of chips and controlling diameters. For other aluminum alloys such as 2017-T4 and 2024-T4, 5° to 10° is recommended. Although large rake angles do promote free cutting, some difficulty may be experienced in controlling the finished diameter. The correct rake angle depends on the feeds and speeds of the particular operation. The exact rake angle is not so important for machining aluminum as for some other metals.

Q. Our reaming operations with aluminum have resulted in too much burnishing. How can we correct this?

A. A definite cutting action is necessary in reaming aluminum. Reamer life is also shortened when there is an insufficient amount of stock to be removed. If the drill is too near the reamer size or cuts oversize, the reamer will not have enough bite and as a result may work harden or burnish the sides of the hole. The tendency in such a case is to wedge rather than cut, resulting in reamer wear or breakage. Therefore, holes should be approximately 0.006 to 0.016 inch undersize.

Q. What are the recommended point angles for drills used in drilling aluminum?

A. The point angle can be altered according to the hardness of the alloy being worked and the type of operation. The harder the materials, the flatter the point of angle. For most aluminum alloys, the included point of 116 to 118 degrees as supplied on the standard drill should be increased to 130 or 140 degrees. For ease of penetration in high-silicon-aluminum alloys, a drill having a point of approximately 90 degrees is advisable. A 60 degree angle can be used for softer alloys.

* * *

For the *right* answer, ask your Kaiser Aluminum Distributor

Kaiser Aluminum Distributors have helped hundreds of fabricators find the answers to difficult problems. Whether it's selecting the right material for a particular job, suggesting more economical methods of operation, or solving complicated production problems, your Kaiser Aluminum Distributor is ready to give you instant assistance.

Naturally, you can always depend on him for prompt service in supplying you with aluminum cut to your specification *as you need it*. Take advantage of the personalized service and technical know-how offered by your Kaiser Aluminum Distributor. Call him today!

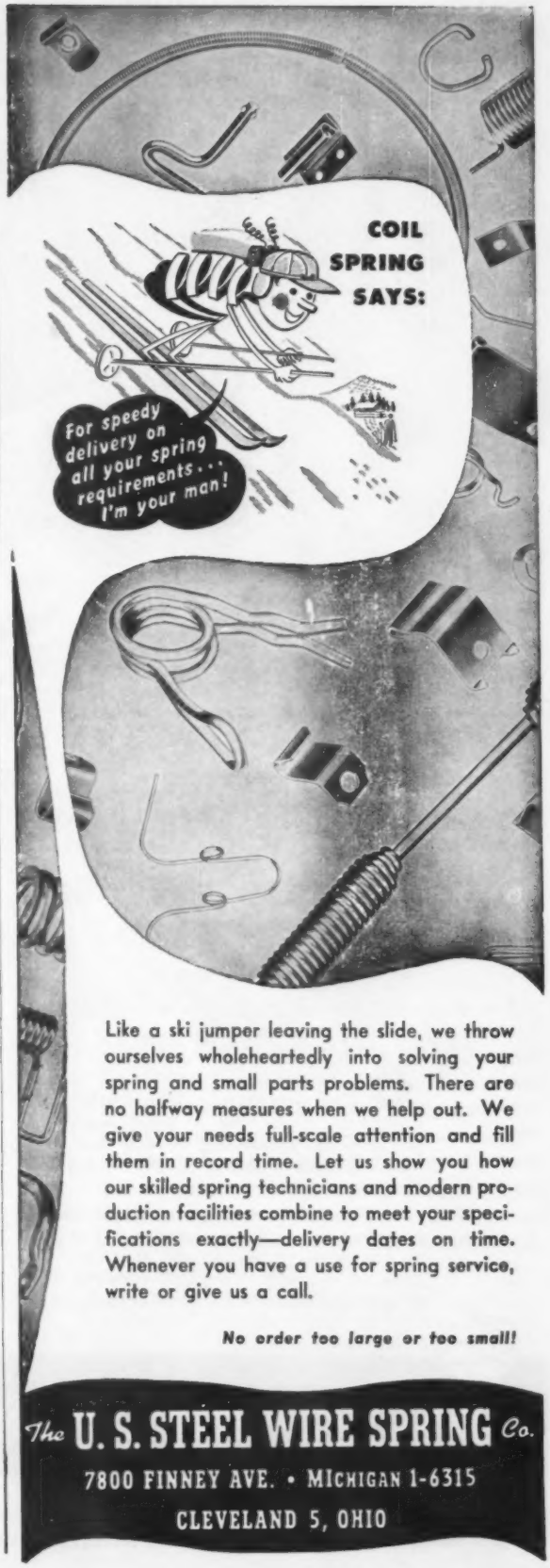
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For 90 years, Lamson-manufactured bolts, nuts and screws have played a major role on the drawing boards and the assembly lines of industry. Constant research and progressive engineering have kept Lamson fasteners abreast of the growing demand for "better ways to put products together".

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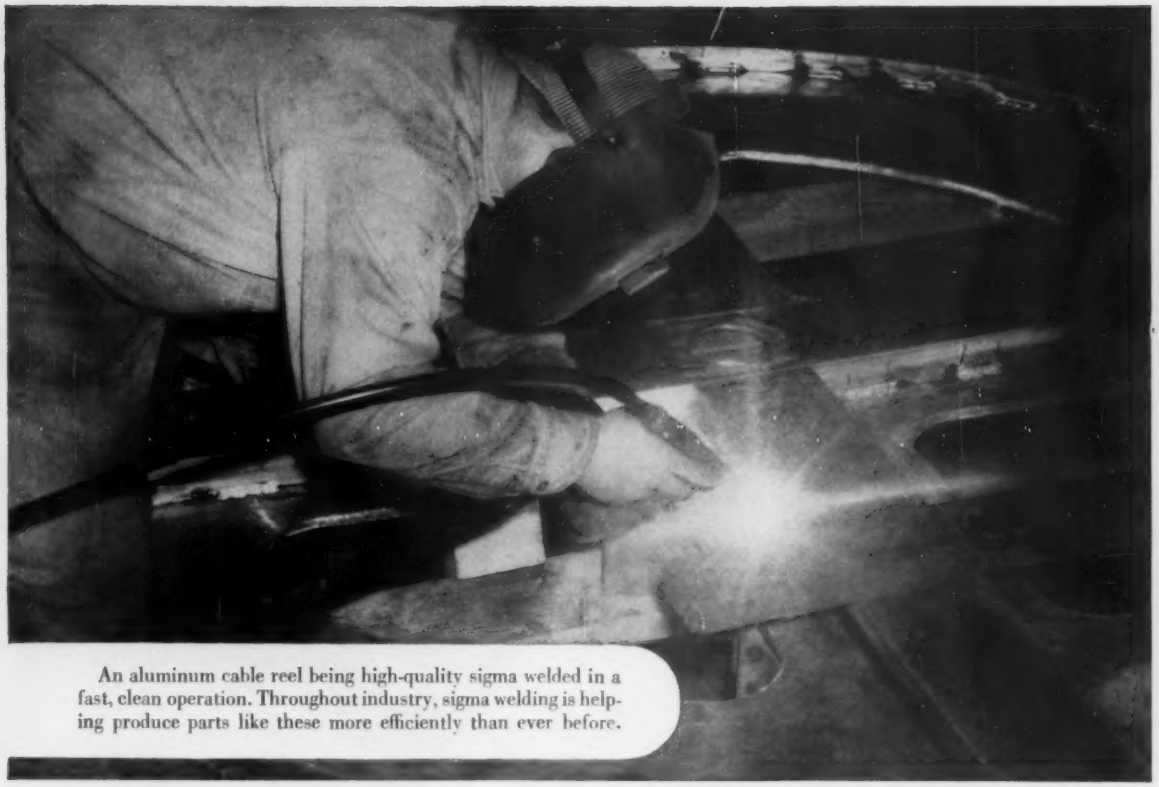
These are only a few of the many reasons why your product will be a *better* product if it's fastened by Lamson & Sessions!



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An aluminum cable reel being high-quality sigma welded in a fast, clean operation. Throughout industry, sigma welding is helping produce parts like these more efficiently than ever before.

SAVED-50% of fabricating cost...

by using

SIGMA WELDING

Sigma welding's combination of automatic wire feed, and dependable argon gas-shielding accounts for the fifty per cent cost saving made in fabricating aluminum cable reels like the one shown above. Top quality welds are made in these ¼ and ½ inch thick aluminum parts at speeds up to 20 inches per minute—and no post weld treatment is necessary.

The Ease of Handling gained by automatic wire feed both simplifies and speeds welding operations. A shield of inert argon gas envelopes and protects the weld puddle from harmful effects of the atmosphere, and eliminates need for flux.

Sigma Welding Is Ideal for a Wide Range of Jobs because it joins all commercially fabricated metals, and can attain full penetration up to ¼ inch in a single pass. A complete line of portable manual, and automatic mechanized apparatus is available—and all are easy to operate and maintain.

For more information on sigma welding, or on any of LINDE's modern methods of joining metals, call your local LINDE representative—or write for free illustrated literature. Start saving now, do it today.

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BLAW-KNOX

makes what it takes

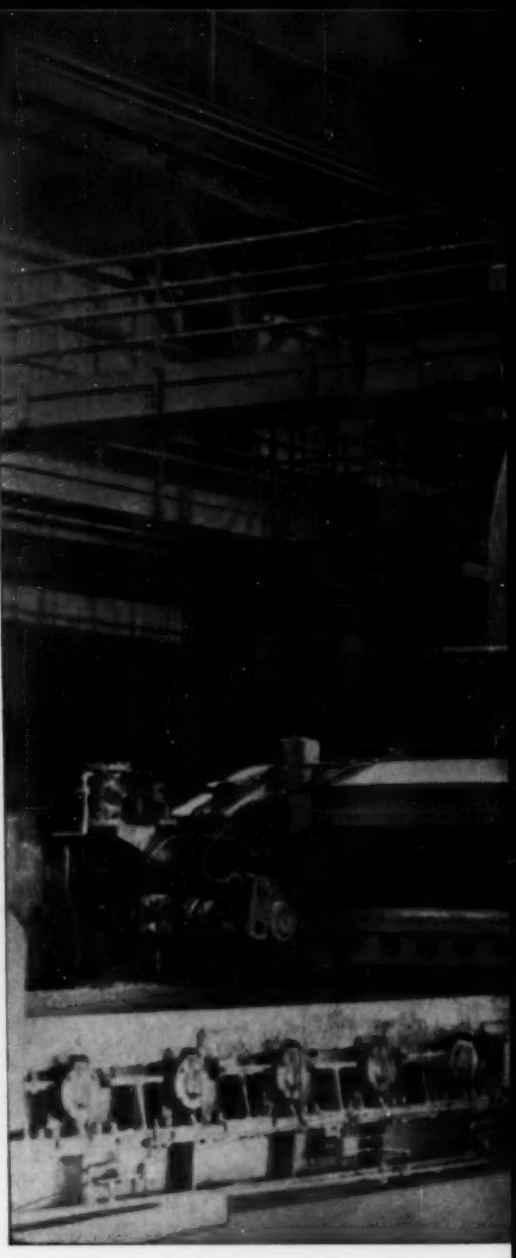
to hot roll high-tonnage

top quality sheet

This CONTINENTAL 80-inch, 6-stand continuous hot strip mill in the United States Steel's Gary Sheet and Tin Mill was designed and engineered for heavy duty and high-speed finishing. It is well-known throughout the industry for excellent tonnage performance and quality.

In addition to these large mills, Blaw-Knox builds single-stand reversing hot strip finishing mills, complete with all auxiliaries.

Blaw-Knox designs and builds *complete* rolling mill installations—assumes undivided responsibility from preliminary engineering to satisfactory operation. At any time we'll be glad to discuss your plans with you.



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Complete rolling mill installations . . . including all auxiliary equipment . . . for ferrous and non-ferrous metals

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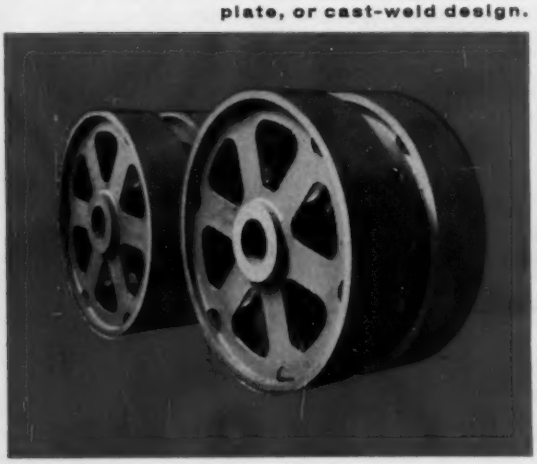
CONTINENTAL

ROLLS—Iron, alloy iron and steel rolls for all types of rolling mills.



CONTINENTAL 80-inch continuous hot strip mill in the Gary Sheet and Tin Mill of the United States Steel Corporation.

WELDMENTS—fabricated steel plate, or cast-weld design.

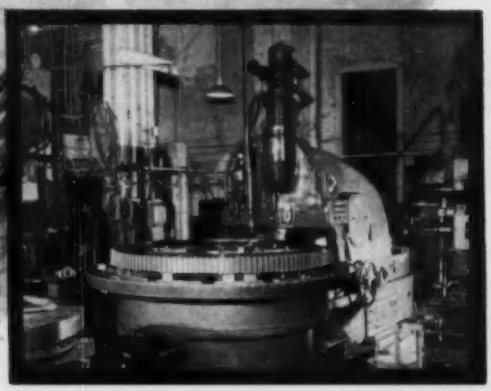


CASTINGS—carbon and alloy steel castings from 20 to 250,000 pounds.



POWER to build America's Highways
delivered by FELLOWS-CUT GEARS





120-Inch Gear Shaper set-up for 138-tooth cast steel gear of 290-330 Brinell, 5" face width, 1.783 C.P., 1.180" total depth of cut. Four cuts—1181 min. approx.



100-Inch Gear Shaper cutting 73-tooth internal gear, 3½" face width, 1.8235 D.P., 1.007" depth of cut. Material—steel casting 197-235 Brinell. One cut—320 min. approx.

The machines that move mountains of material for America's highway programs demand good, rugged, smooth running gears that will transmit, without failure, the many tons of force required.

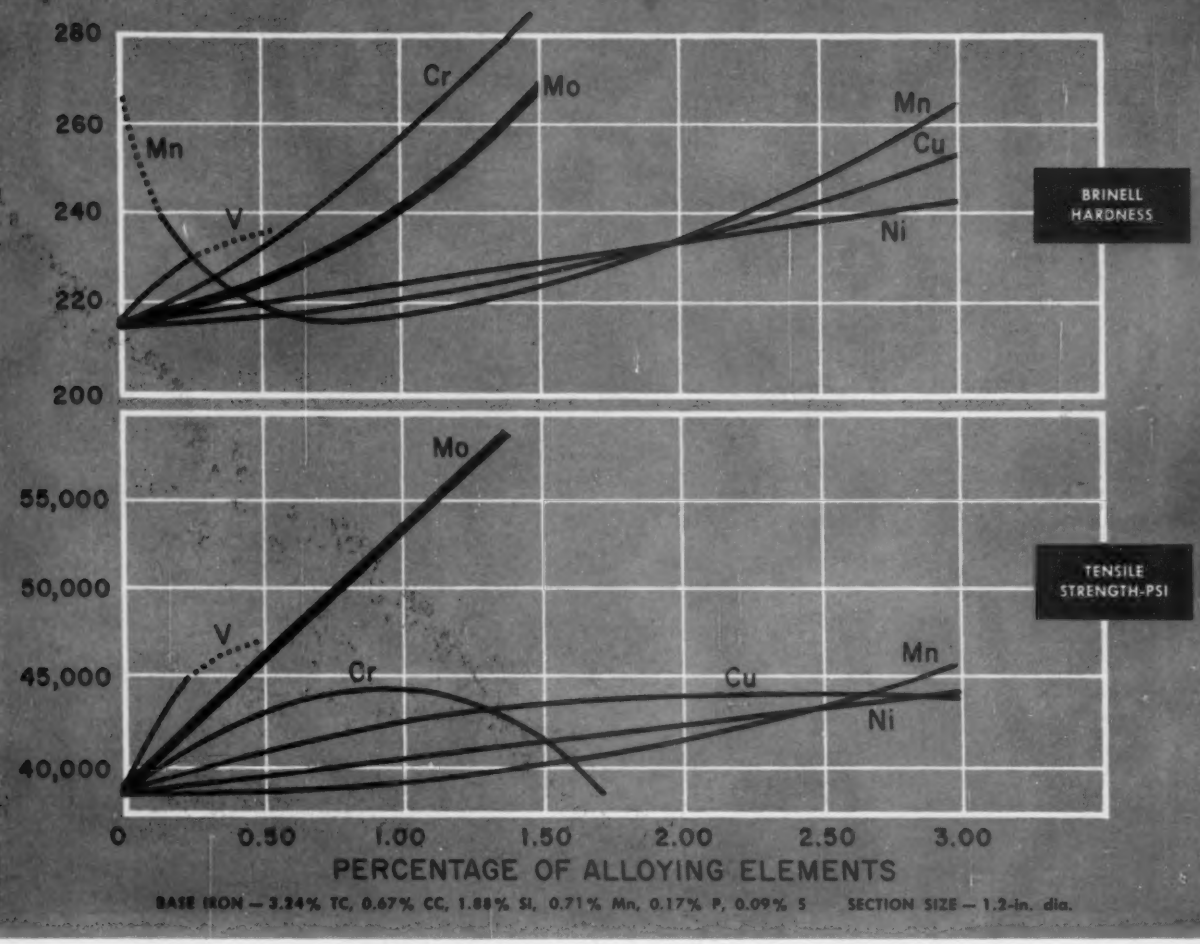
The well known Thew Shovel Company of Lorain, Ohio is one of the major construction equipment makers that use Fellows machines to produce these gears. The largest Thew-Lorain gears require the largest capacity Gear Shapers in the Fellows Line, the 100-Inch and 120-Inch.

These two Gear Shapers are designed to take heavy cuts at coarse feeds on spur or helical gears. Capacities: 28" to 100" for externals and 46" to 100" for internals on the 100-Inch; 28" to 120" for externals and 46" to 120" for internals on the 120-Inch. Maximum face width on each is 8".

For *full* information about the complete Precision Line of cost-cutting Fellows Gear Production Equipment get in touch with your Fellows representative. Write, wire or phone any Fellows office.

THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont
Branch Offices:
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THE PRECISION LINE **Fellows** *Gear Production Equipment*



Note how additions of moly, up to 1.5%, produce proportional improvements in strength. And, with moly, hardness increases much more slowly. It means higher strengths can be used with less danger of impaired machinability.

each ½% Moly adds 7000 psi to strength of cast iron...

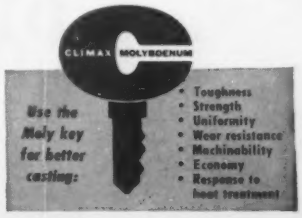
A little moly adds a lot of strength — for molybdenum increases strength more than any other common alloying element, with the exception of small vanadium additions. A rule of thumb is that fifty points of moly raise tensile strength 7000 psi. And without sacrificing toughness. Actually, moly improves toughness at least as much as strength.

What's more, versatile moly aids in obtaining uniform response to heat treatment . . . and in producing machinable, growth-resistant castings. Moly is easy to use, too.

With most grades of cast iron, moly requires no change in the character of the charge, normal melting practice, or the base metal. And foundrymen like the fact that the small additions necessary may be made at the spout or in the ladle.

Write now for "Why Moly Iron". It's the full story of how and why moly adds strength faster than hardness, how it increases fatigue and torsional strength—in short why moly makes better cast iron. Climax Molybdenum Co., Dept. 2, 500 Fifth Avenue, New York 36, N. Y.

CLIMAX MOLYBDENUM





Simple hand assembly of five .209" formed components into a complete housing dramatically demonstrates the precision of stampings produced on By-Products' new press line. No additional finishing or machining is necessary before final fit-up.

Formed to FIT . . . as they come off the line!

OUR VERSATILE NEW PRESS LINE CAN CUT PRODUCTION STEPS FOR YOU!

■ With a new press line for deep drawing and mass producing light gage precision parts—like the units that make up the compressor housing pictured above—*plus* extensive facilities for producing heavy plate shapes, By-Products Steel Co.'s service is now even more flexible, more useful to you!

Today, By-Products can satisfy requirements for precision formed components all the way from sheet gages up into heavier plate thicknesses. Combined with the new press line, more than 150 machines offer you the most complete plate shaping service available.

We've made the investment in equipment and manpower! You pick up the benefits . . . in lower overhead . . . fewer production steps in your shop . . . reduced freight . . . virtually no scrap loss . . . lower production costs.

Get complete details. Write, outlining your interests, to Manager, Marketing Service, 831 Lukens Building, Coatesville, Pennsylvania.

■ PRESS LINE UNITS

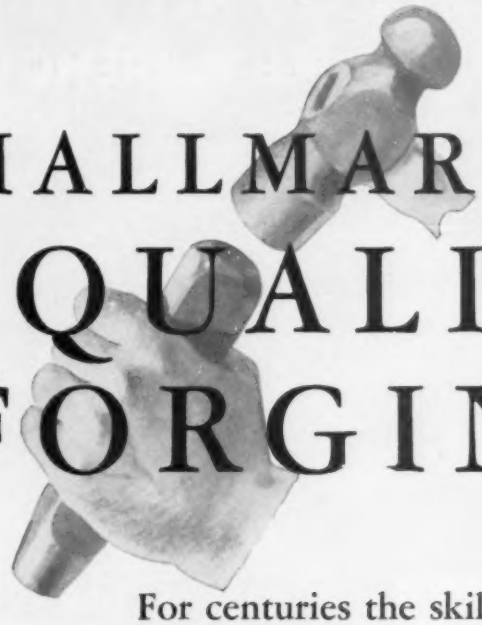
1. Automatic Loader and Greaser
2. 900 Ton Press
3. Washing Machine
4. Annealing Furnace
5. 600 Ton Press
6. Trimming Press
7. 22 Ton Punching Press
8. 45 Ton Punching Press
9. 150 Ton Punching Press

Units are linked by reversible conveyors for fast, economical production.

BY-PRODUCTS STEEL CO. LUKENS

A DIVISION OF LUKENS STEEL COMPANY, COATESVILLE, PENNSYLVANIA

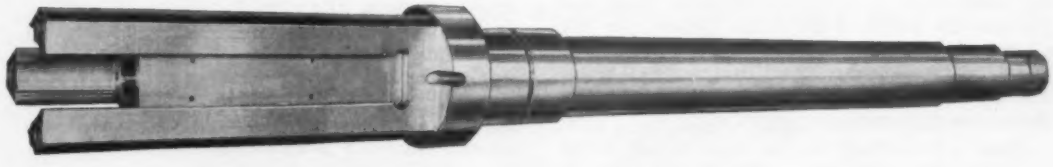
HALLMARK OF QUALITY FORGINGS





For centuries the skilled craftsman has shown his pride in his workmanship by identifying his work with a "mark".

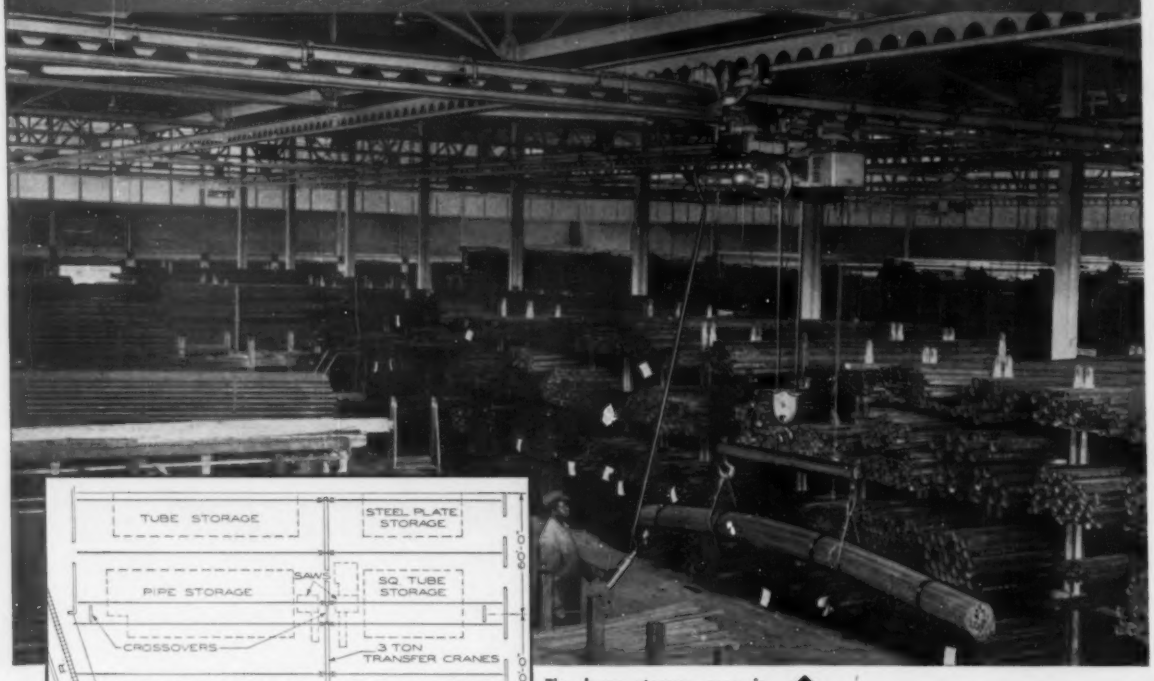
The trade-mark of the National Forge and Ordnance Company stamped on your forging is your guarantee that the forging has been carefully and skilfully made to meet your specifications exactly.



NATIONAL FORGE & ORDNANCE CO.

IRVINE, WARREN COUNTY, PENNA.

TRAMRAIL TRANSFER CRANES *SYSTEMATIZE* HANDLING IN STEEL WAREHOUSE



The large storage area is completely covered by Tramrail crane service. Every item can be seen from the floor and readily reached with the two transfer cranes.

▲ The Tramrail transfer cranes make it easy to place the long unwieldly pipes and bar stock into storage at any height. This makes for orderliness, which is an important factor in securing high operating efficiency.

THE BIG modern warehouse of J. M. Tull Metal & Supply Co., Atlanta, Georgia, was designed to make use of overhead Tramrail equipment to enable the handling of large unit loads in and out of storage with the least effort and in the quickest time.

The principal storage section is provided with two parallel runways each having three tracks. On both runways is a 64-foot transfer crane that travels the length of the room. Cross-overs are provided, enabling a hoist carrier transferring from one crane to the other. This makes it possible to haul materials between any two points in the entire area without rehandling.

Steel is constantly on the move in this active plant. From 60,000 to 70,000 lbs. are brought in by railroad car daily and like amounts are shipped out. The material is unloaded from railroad cars at one end of the building and placed into storage. It is shipped out on trucks which are loaded at the other end.

The overhead crane system makes it possible to place incoming materials into allotted storage spaces at once. The need of storing temporarily in aisleways or other areas and extra handling which this entails is eliminated. Thus, the warehouse is kept orderly at all times and every item is readily seen and conveniently reached. Danger of handling accidents is minimized and overall efficiency is unusually high.



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For Removing RUST and SCALE



ALKA-DEOX® DERUSTING PROCESSES. Alkaline materials used both electrolytically and non-electrolytically for rapid removal of rust and scale from steel, cast iron and malleable iron. No attack on basis metal. Uses Enthone Alka-Deox 114 and Alka-Deox 134.

ENTHOL® — CLEANER AND RUST REMOVER FOR STEEL. A solvent acid cleaner for rapid removal of oil, rust and oxide from steel, zinc, aluminum and other metals to prepare them for painting or organic finishing.

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ACID ADDITION AGENT —STOPS ACID FUMES. A surface active material extensively used in acid pickles to reduce fuming, to give better wetting, and to promote better pickling.

Write for fully descriptive literature.

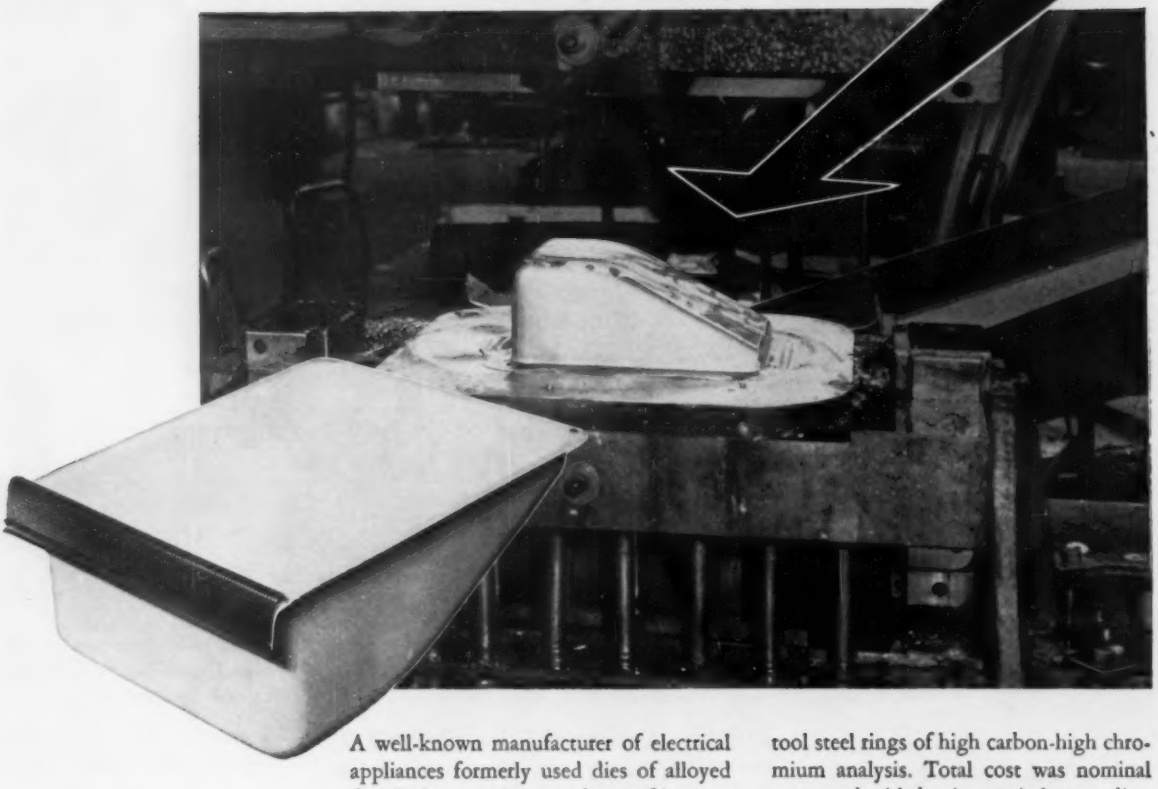
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Metal Finishing Processes • Electroplating Chemicals

Here's how A-L CAST-TO-SHAPE TOOL STEELS solved a serious scrap problem on this job



A well-known manufacturer of electrical appliances formerly used dies of alloyed ductile iron castings to draw refrigerator crisper pans.

These dies had to be redressed after every 10,000 pieces (approximate cost: $1300 each) and had to be replaced after every 30,000 pieces. 8 to 10% of the pans were scrapped due to defects.

Because of this scrap problem and the severity of the draw—a 52% reduction of the steel—it was decided to rebuild the dies using a suitable grade of tool steel.

A 2" cut was taken off the top of the old cavity and the draw ring. These cuts were replaced with A-L Cast-to-Shape tool steel rings of high carbon-high chromium analysis. Total cost was nominal compared with buying entirely new dies.

Each of the revised dies has produced approximately 500,000 pans. Their condition indicates that probably *twice* that many can be drawn before the dies must be redressed. Defective pieces have been reduced to a mere 1½ to 2%—*an 80% reduction!*

● Ask your A-L representative TODAY how Cast-to-Shape tool steel can help solve your production problems . . . or write ***Allegheny Ludlum Steel Corporation, Forging and Casting Division, Detroit 20, Mich.***

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"FORGING AND CASTING PRODUCTS"

Contains the latest information on FCC Air Hardening, Oil Hardening and other Cast-to-Shape Tool Steel Specialties that can save you time and money . . . also Composite Die Sections and Smooth Hammered Forgings in a wide range of tool and stainless steels. *Get your copy NOW*

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CONTINUOUS CASTING MACHINES
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Multiple Strands up to 25 feet length



Simultaneous Casting of three Brass ingots 8" dia.



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Number, Size and Length of Ingots to Individual Requirements

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Builders of specialized Equipment for the Non-ferrous Metal Industries

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Caterpillar Chooses WILLIAMS-WHITE Presses



DW15 Tractor with No. 15 Scraper and D8 Tractor at suburban housing project, Tulsa, Oklahoma.

All WILLIAMS-WHITE *machines are custom-built to meet your individual needs*

The press illustrated at right is one of the new WILLIAMS-WHITE machines installed in the Caterpillar Tractor Co. plant in Decatur, Illinois.

It is essentially a straightening press but the wide table, 90" by 54", makes it a versatile tool for other operations.

In choosing these presses, Caterpillar takes advantage of WILLIAMS-WHITE & CO.'s 102 years of machinery building experience.



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EDWARD A. LYNCH MACHINERY CO.
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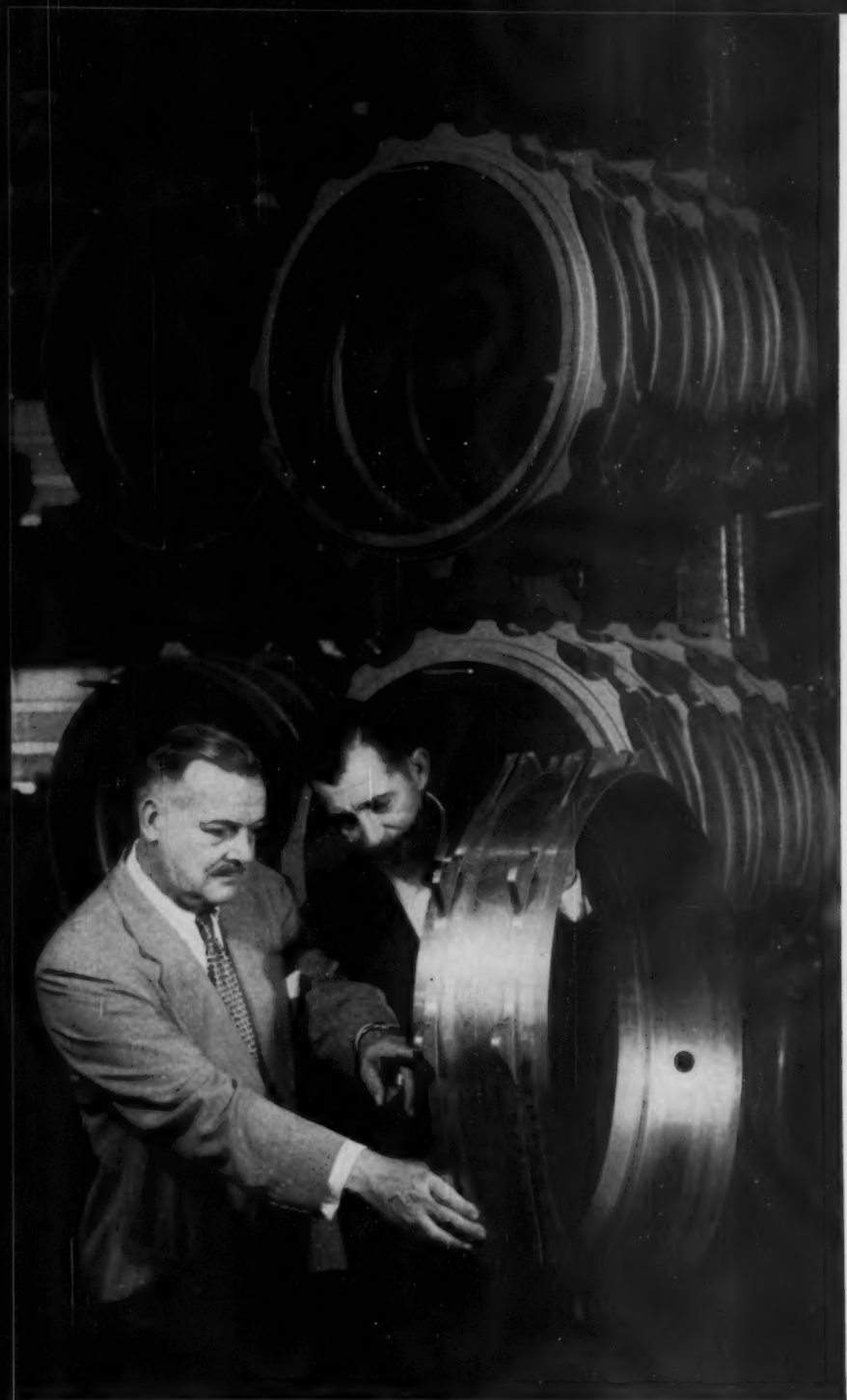
The press above is typical of machines built to specification by WILLIAMS-WHITE & CO. If you have need of such equipment, we will be pleased to receive your inquiry. Our staff of engineers and designers is at your service, without obligation.

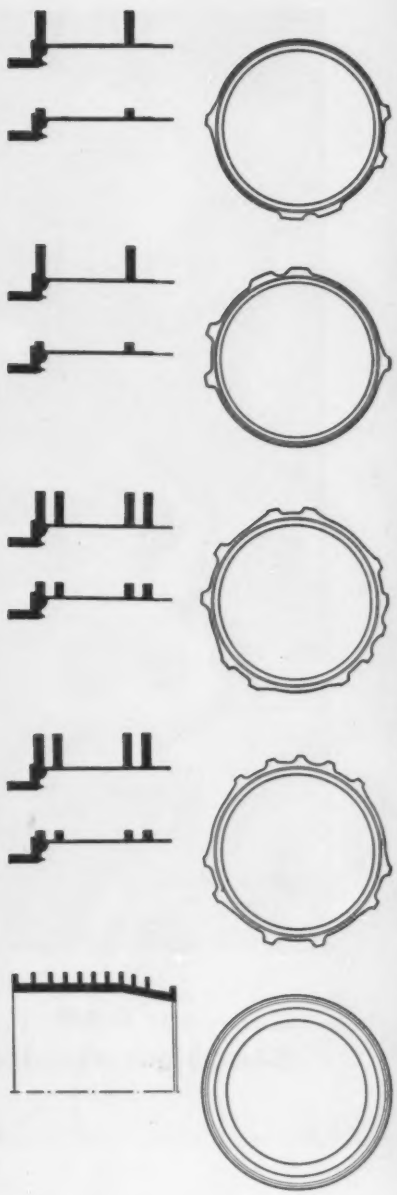
BUILDERS OF MACHINERY SINCE 1854

WILLIAMS-WHITE & Co.

302 EIGHTH ST. • MOLINE, ILLINOIS

PRESSES • BULLDOZERS • BENDERS • PUNCHES • SHEARS





Typical ring sections and profiles showing lug configurations in a smaller scale.

STAINLESS STATOR RINGS

One of Cameron's most interesting contributions to military and commercial air-power today is the production of forged, stainless steel, stator rings. Our unique processes make possible precision forgings with odd lug configurations, large diameters and a vastly superior grain structure. Shapes and sizes heretofore costly to produce as a forging are now sound economy at Cameron.

The study of specialized alloys to meet the extreme demands of today and to anticipate those of tomorrow parallels forging production and is a part of our progress.

Investigate these advantages — write or call .....

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IRON WORKS, Inc.

SPECIAL PRODUCTS DEPARTMENT
P. O. Box 1212, Houston, Texas



Call your AIM*... as Alcan did...

Steel strapping aluminum ingots aids customers



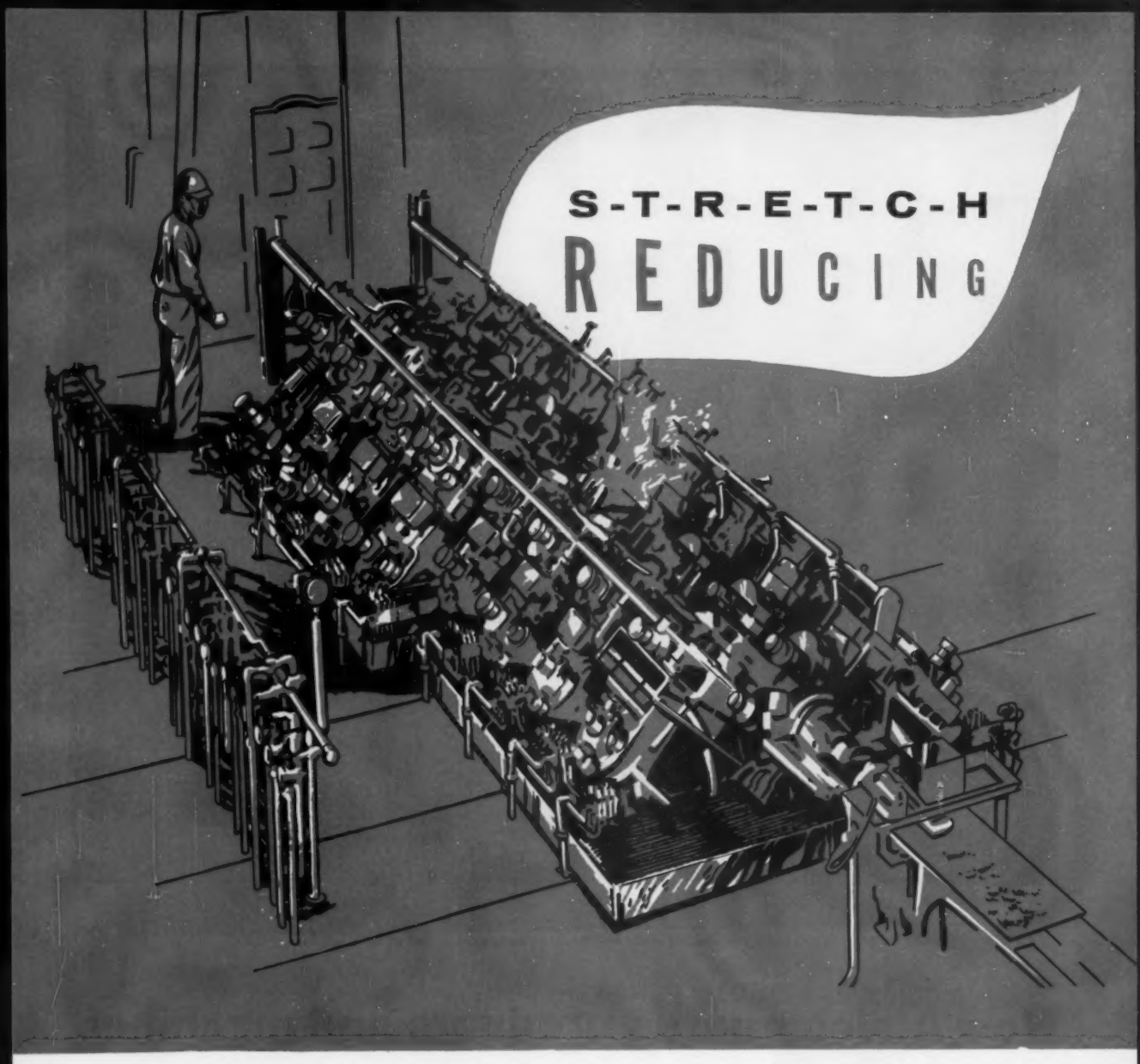
Acme Idea Man, Art Rochette, worked with Alcan technical men on this problem.

ALUMINUM COMPANY OF CANADA, LTD., Montreal, P. Q., modified its method of bundling ingots and improved freight car bracing techniques for added customer service. The new procedures insure delivery of intact, easily-handled bundles of ingots at Alcan's customers' plants. This lading protection advance is an example of how Alcan technical men and the Acme Idea organization cooperated to determine and prove a better packing and shipping method. (Idea No. S3-1.)

As a result of the Acme Idea method, 41 aluminum ingots are securely nested and bundled with Acme Steel Strapping. Using new freight car bracing techniques that help prevent disruption, the bundled ingots arrive at destination intact and are easily handled by lift truck. Car loading is faster and easier while unloading and storing by Alcan's customers is speeded up, more economical.

***Call your Acme Idea Man.** He will be glad to show you his file of time and money saving ideas. Write: Dept. IFS-126, Acme Steel Products Division, Acme Steel Company, 2840 Archer Ave., Chicago 8, Ill., In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Avenue, Toronto 13, Ont.

ACME STEEL **STEEL STRAPPING**



● Much of the news in Seamless concerns the Stretch Reducing principle. The first such mill was installed by National Tube Division of U. S. Steel Corporation. Aetna-Standard collaborated with National Tube in designing this mill and supplying the equipment. Since that time, much development work has been done on the equipment and the process.

Chief advantage of the Stretch Reducing method is the resulting increase in tonnage from existing Seamless Tube Hot Mill equipment for the production of A. P. I. steel tubing. Briefly, tubes of the larger O. D. (6″ to 7″) are produced through the existing Piercer, Plug Mill and Reelers, thereby obtaining a maximum number of tubes at an increased tonnage per operating hour.

Aetna-Standard has built and is building most of the Stretch Reducing mills. If your group needs facts on cost, design, yield and other information, Aetna's Seamless engineers can help you.

AETNA • STANDARD

THE AETNA-STANDARD ENGINEERING COMPANY

GENERAL OFFICES: PITTSBURGH, PA. **PLANTS: ELLWOOD CITY, PA., WARREN, OHIO**

CONTINUOUS GALVANIZING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC



Alnico permanent magnets power the new Eriez Ferrotrap, visible above at left of the paper. Trap body and cover plate are Type 316 stainless chromium-nickel steel, non-magnetic and easy to clean.

How Alnico guards products and machines ...traps tramp metal continuously

This operator holds a collection of nails, paper clips and other ferrous contaminants. All were removed by the Eriez Ferrotrap from liquid caramel being pumped through a candy plant pipeline.

Keeping hot, viscous caramel free of tramp iron is an obviously difficult task. But a new Eriez unit, aptly named the Ferrotrap, does this sort of job with multiple rods or "fingers" containing Alnico permanent magnets.

No need for electromagnets, current and accessories, because at temperatures up to 850°F the powerful, life-time magnetic strength of a high nickel alloy . . . Alnico . . . assures positive trapping of iron particles. Even nuts, bolts, and the like.

Units that protect not only product purity, but also filters, mixers, pumps and other costly equipment are made practical by the powerful magnetic properties of Alnico, an aluminum-nickel-cobalt-iron alloy.

Nickel . . . an essential element in Alnico . . . improves hundreds of other alloys utilized in industry. So if you have a problem involving metals, consult us on the use of nickel or nickel alloys. But if you wish further information about the Ferrotrap, write Eriez Manufacturing Company, Erie 6, Pennsylvania.

INCO TRADE MARK **THE INTERNATIONAL NICKEL COMPANY, INC.** 67 Wall Street New York 5, N. Y.

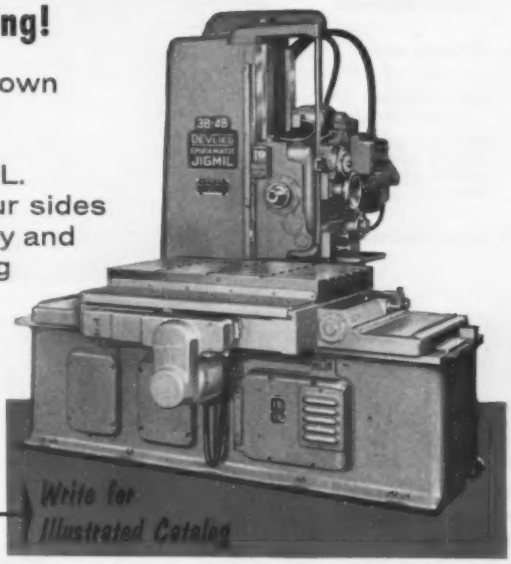
DIFFICULT JOBS ARE *routine on* DE VLIEG SPIRAMATIC JIGMILS®



PHOTO COURTESY OF DANROY BORING CO.

DeVlieg *SPIRAMATIC* JIGMILS® permit accurate machining of workpiece from 4 sides at 1 setting!

The above photograph, taken in a well known Detroit Tool Shop, illustrates a Special Hydraulic Fixture being machined on a DeVlieg Model 3B-48 *SPIRAMATIC* JIGMIL. This job was completely machined on four sides at one setting to precise limits of accuracy and operations included drilling, boring, milling and O.D. turning 22" diameter trunnion.



Come to Detroit...

See a practical demonstration of the JIGMIL Technique

DE VLIEG MACHINE COMPANY

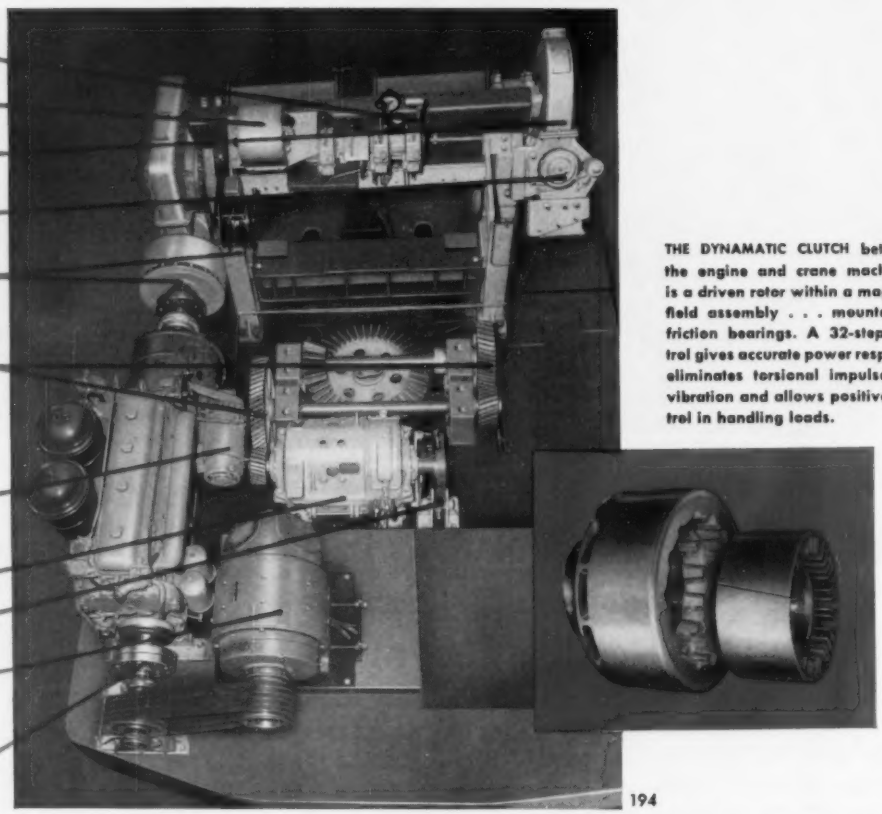
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HOW THE ELECTRIC ROTATING MECHANISM IN I. B. LOCOMOTIVE CRANES increases operating speed and efficiency



Wherever crane rotation is unusually severe (magnet and bucket operations), an electric rotation unit (optional at extra cost) can be supplied with Industrial Brownhoist Cranes. The savings in maintenance and the greater efficiency plus the elimination of friction clutches offset the cost in a short time. The generator in the electric rotating motor is large enough to supply power for magnet service, and the complete rotation mechanism is easily accessible, being mounted on the top of the rotation bed. Reversing the flow of current through the motor, quickly and smoothly reverses the direction of rotation. • The carbody, trucks, monitor-type cab, and machinery arrangement of I. B. equipment have been equally well engineered. Write for Catalog No. 548 for complete information.

- PUSH BUTTON MAGNET CONTROL
- ROTATING CONTROLLER
- SAFE WORM DRIVEN BOOM HOIST
- AUTOMATIC BOOM HOIST BRAKE
- DYNAMIC CLUTCH AND CONTROLLER
- ELECTRIC ROTATION GEAR REDUCTION UNITS MOUNTED ON ANTI-FRICTION BEARINGS (HERE SHOWN WITH OIL CASES REMOVED)
- 1500-WATT BATTERY GENERATOR FOR STARTING AND NIGHT LIGHTING EQUIPMENT
- ROTATING MOTOR
- ROTATING BRAKE
- ROTATING AND MAGNET GENERATOR SUPPLIES CONSTANT VOLTAGE
- FLEXIBLE COUPLING



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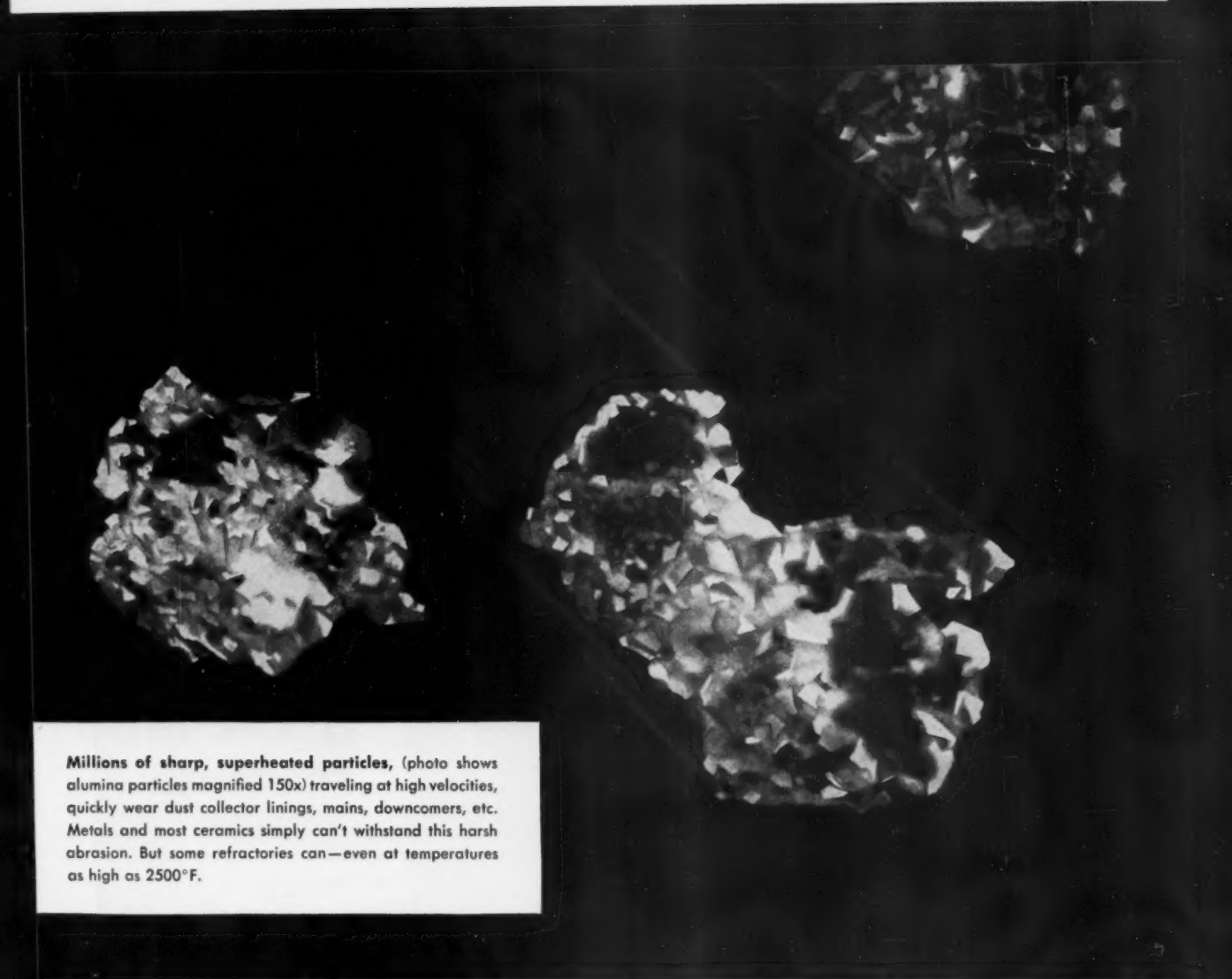
THE DYNAMATIC CLUTCH between the engine and crane machinery is a driven rotor within a magnetic field assembly . . . mounted on friction bearings. A 32-step control gives accurate power response, eliminates torsional impulse and vibration and allows positive control in handling loads.

BROWNHOIST

BROWNHOIST MATERIALS HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

SUBSIDIARY OF Penn-Texas CORPORATION

INDUSTRIAL BROWNHOIST CORPORATION BAY CITY, MICHIGAN • DISTRICT OFFICES: New York, Philadelphia, Cleveland, San Francisco, Chicago; Montreal, Canada AGENCIES: Detroit, Birmingham, Houston, Los Angeles.



Millions of sharp, superheated particles, (photo shows alumina particles magnified 150x) traveling at high velocities, quickly wear dust collector linings, mains, downcomers, etc. Metals and most ceramics simply can't withstand this harsh abrasion. But some refractories can—even at temperatures as high as 2500°F.

Refractories . . . where **abrasion** is a problem

Unequalled resistance to abrasion whether caused by tiny gas-borne particles or sliding steel billets—is one of the most useful properties of CARBOFRAX® silicon carbide refractories. For example, a CARBOFRAX dust collector lining on an ore sintering machine is still in use after 10 years service.

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Wear resistance is not the only unusual property of these refractories. They also offer heat conductivity roughly 11 times that of fireclay, with sufficient hot strength to withstand 25 psi at 1720°C. CARBOFRAX refractories are but one of many super refractories pioneered by Carborundum and offering a wide range of unusual properties.

Carborundum's new magazine "Refractories" pinpoints many practical applications for these unusual products. The forthcoming issue carries a feature article on "Wear Resistance". Send for your copy today.

CARBORUNDUM
Registered Trade Mark

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all in the new magazine "Refractories"

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The Carborundum Company, Perth Amboy, N. J.

Please send me the forthcoming issue of "Refractories".

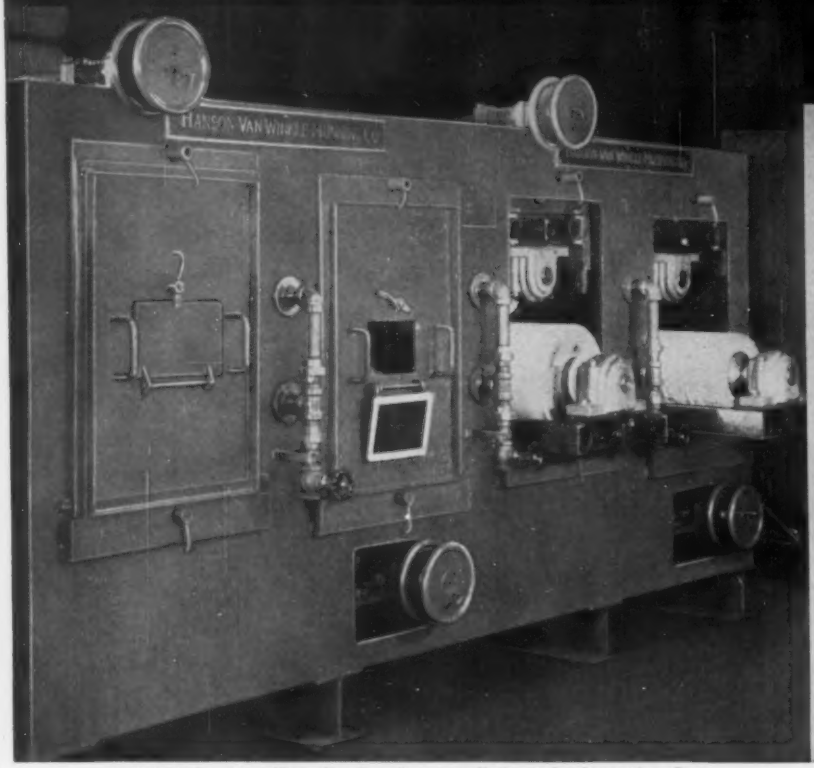
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H-VW-M Scrubber Unit. Brush units are pulled out for inspection. In a matter of minutes they could be replaced, if necessary with new brushes.

...and no down time either! Brushes are replaced easily while unit is in operation!

H-VW-M Scrubber Units—which adapt to fit into any system—are equipped with an exclusive, patented device that permits replacement of brushes *while the unit is running.* Just turn a few bolts, slide worn brush out, and insert replacement. Not a moment's production time is lost!

Add the advantages of this remarkable new feature to the enormous savings you'll realize in cleaning, reworking and inspection time, and you'll see why the rugged, efficient H-VW-M Scrubber Unit has no equal. 3149

Get more facts about H-VW-M Scrubbers, with their exclusive easy-brush-replacement feature, by writing today for Bulletin HB-100.

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Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

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$80 a month
invested in equipment
SAVES him thousands
a year in needless rejects
...his customers are *happy*

this man doesn't



high reject rate
(correctable by radiography)
COSTS him thousands
a year in needless waste
...his customers *howl*

Makes no difference what you make or buy or sell...
if it needs "seeing into" for quality control, radiography (gamma or x-ray) can probably profit you, as it does others.

Talk it over with your local Picker representative * or write us outlining your problem and, if possible, sending typical samples. We'll make tests and tell you frankly whether radiography holds any promise for you.

Costs you nothing to find out...
maybe it's costing you a great deal right now NOT TO.

Picker x-ray

PICKER X-RAY CORPORATION
25 South Broadway, White Plains, N. Y.

*There's probably a Picker district office near you (see local 'phone book).

Picker... your one Source for Everything in Radiography and Fluoroscopy

"...we consider advertising



In 1918, Dudley E. Sanderson joined Oneida Ltd., silversmiths, as a timekeeper. Four years later he moved into sales, and by 1923 was traveling the New England territory. Transferred to Canada in 1926, he became division sales manager, with certain advertising and merchandising responsibilities. In 1945, Mr. Sanderson returned to his native Oneida, N.Y., where he is now a director of the company, Vice President in charge of sales, advertising, and sales promotion of advertised trademarked lines. A recent talk with Dud Sanderson about the use of business publications proved both enjoyable and worth while. Here are the highlights of the interview.

Q When did Oneida Ltd. first advertise?

A In 1902. It was in January of that year that the directors appropriated $5,000 to advertise their new product, called Community Plate. It was in September, I believe, that the first advertisement actually appeared in print.

Q Were these early advertising efforts considered successful?

A I'm afraid not. For the first 8 years, our advertising showed no real promise of even paying for itself. However, by 1909 results were evident, and by 1925 advertising had raised Community Plate to pre-eminence in the quality silverplate business. It had succeeded in convincing the public that the best plated ware is, from a practical standpoint, as good as sterling—in some ways better.

Q Were your early advertisements or campaigns unique in any way?

A Very definitely. For one thing, I believe we were among the first advertisers to use large units of space. We did this for several reasons. One was the conviction that our silver patterns should be shown in the fullest detail possible. Another was the fact that large advertisements generally create a favorable impression of the advertiser's stature and stability and thus inspire reader confidence in the product. Last, but by no means least, was the knowledge that large advertisements attract the attention of more people.

Q And in what other ways did Community Plate advertising pioneer?

A In 1910, when full-page black and white advertising was still considered venturesome, we scheduled full-page full-color advertising. Then, too, Community was among the first to buy the finest in advertising art. Realizing that beauty of presentation could be a major force in building consumer demand for silverplate, we inaugurated the famous "lace background" campaign. Rare laces were brought from every part of the world, often at great expense, to be photographed as background for our silverware displays.

Q Have you advertised consistently since the beginning?

A Yes, without interruption. Even during World War II, with practically nothing to sell on the open market, we continued to invest advertising dollars in the future—against the day we would again be competing for our share of the consumer dollar.

Q At what point did you start using business publications?

A I can't give you a specific answer to that question, but I do know it goes back many, many years. I also know that we have had a strong schedule ever since those early days.

Q Just what is your advertising philosophy?

A Well, at Oneida we consider advertising an investment, not an expense. We advertise, I suppose, for much the same reasons as other manufacturers. We advertise to tell people about our products—to establish our name, to create a desire, thus a demand, for our products. We also advertise to help our customers, and the many merchants who carry our lines, sell our products. And certainly we advertise to help our own salesmen do the best possible job.

Q Is there any one theme that you stress more than others?

A I wouldn't say that we put particular emphasis on any one theme, but we do try to make our advertising as informative as we possibly can. For example, in business papers we tell dealers what we are doing and what we have to offer that will help them make a profit.

Q Do you use the task method to determine advertising appropriation?

A No, we do not. We arrive at a figure through the use of a formula based on such considerations as sales records, sales forecasts, and a certain amount of hard and cold mathematics, carefully balanced with experience and the judgment of management. It is this last thing that accounts for the fact we sometimes invest in advertising beyond the calculated dollars that come out of our forecast. This was particularly true during the big depression, when, at one point, we were the only company in the industry to continue even a modified advertising program.

an investment, not an expense"

Q Do you have a different philosophy about the use of business papers than of consumer publications?

A No. I can only say this—our present-day philosophy has brought about a substantial increase in our appropriation for business publications. Without referring to figures, I know we are spending more in business papers in 1956 than at any time in our history.

Q Can you cite examples of direct benefit derived from your advertising in business publications?

A Oh yes. Perhaps one of the best demonstrations of its effectiveness can be found in what we experienced when we introduced our line of stainless steel tableware. Prior to that time our salesmen seldom called on housewares departments, and buyers were not acquainted with our company. We promptly launched a sizeable advertising campaign to reach these people, and in a surprisingly short time we reaped success. Not only did our salesmen get audiences, they got orders too.

Q Do you advertise price in business publications?

A Yes, regularly. We believe in advertising price, particularly in the housewares field.

Q In general terms, how do you define the role of business publications?

A Well, first let's consider the editorial side, which I feel to be of tremendous and increasing importance. The editorial pages of a business publication put under one tent all the things a businessman wants to know about his chosen field. They offer him an opportunity to review the experiences of the past, to familiarize himself with current developments, and to look into the future through the eyes of the editors—capable men who are experienced in the art of digging out, evaluating and reporting facts and trends.

Q And how about the advertising side?

A I am convinced that well-conceived and well-written advertisements are a constant source of information to the man interested in keeping abreast of developments in his field. In addition, many readers, I am sure, get very worth-while merchandising hints and suggestions from this source.



Q Let's go back to the editorial side for just a minute. Do you believe that publishers and editors of business papers fully meet their responsibilities?

A I certainly do. I think that along with consumer magazines, business publications have made marked improvements, not only in editorial content and policies, but also in format. They have done much to make it easier for their audiences to read and absorb the subject matter. A case in point is the capsule treatment frequently given long and involved articles that enables even the busiest reader to become generally familiar with the subject.

Q On the subject of frequency, do you believe it necessary to maintain a regular schedule?

A We very definitely believe in continuity. It may not be necessary to be in every issue of a publication but once we start to build an audience we want our advertising to appear frequently enough to hold that audience.

Q What requirements must a publication fulfill before it is added to your media list?

A First of all, of course, it must cover the particular field, or major segment of it, that we are interested in reaching. Then, too, we are very much interested in the editorial content or editorial policies of a publication.

Q How many business publications do you now use?

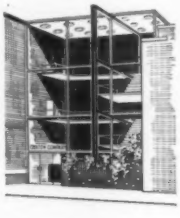
A Approximately 25.

Q Is there any point about your experience with business publications that you care to emphasize?

A Well, yes. Although it is repetitive I would like to go back to one thing I said, for the sake of emphasis. I think the best testimony as to the importance of business publications to us is the fact that we have been putting more and more money into their use. This means that we have not only added new publications, but have also increased our space in the papers we already use. And I would like to go even farther.

Through the use of business publications you are able to communicate with your customers and prospective customers in an atmosphere that is natural to them and most productive for you. In this respect, today's responsible business publications serve a purpose unduplicated by any other selling force.

Chilton publications cover their chosen fields with an editorial excellence and a strict control of circulation that assure confidence on the part of readers and advertisers.



Chilton
COMPANY

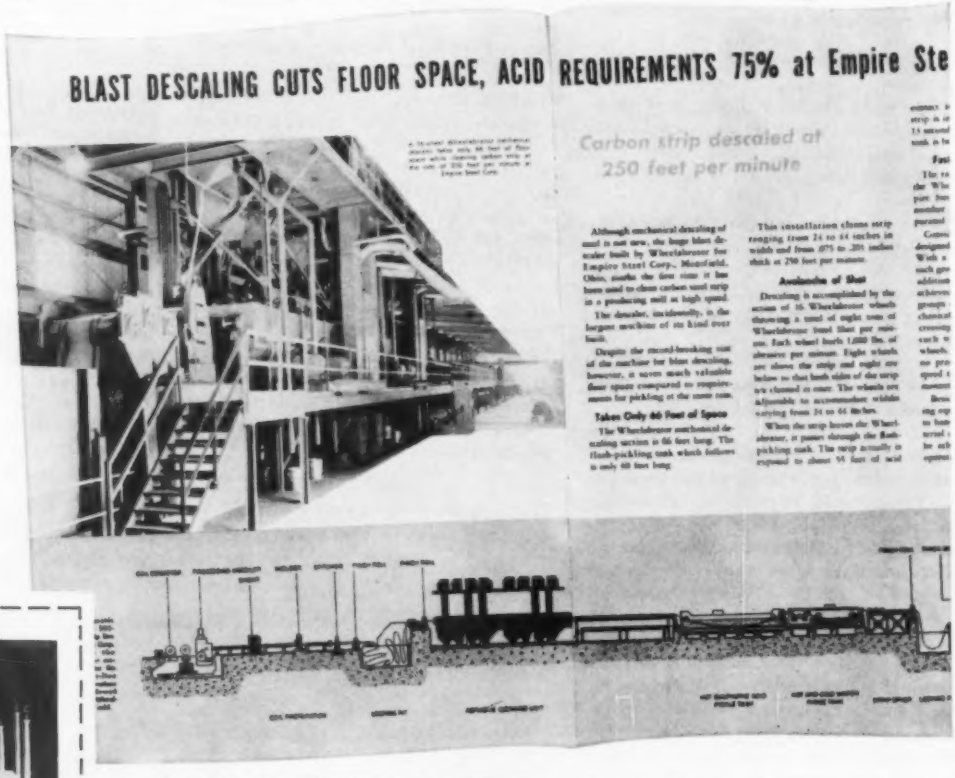
Chestnut and 56th Streets • Philadelphia 39, Pennsylvania

CHILTON PUBLICATIONS: Department Store Economist • Hardware Age The Iron Age • Jewelers' Circular-Keystone • Distribution Age • Motor Age Automotive Industries • Optical Journal and Review of Optometry • Spectator Commercial Car Journal • Boot and Shoe Recorder • Hardware World Gas • Electronic Industries • Butane-Propane News • Book Division

profit from Wheelabrator® savings

descaling strip and sheet steel

Steel producers and processors are rapidly discovering how Wheelabrator Mechanical Descaling brings savings in time, labor, space and material and results in improved final products. In many installations, mechanical descaling requires only 1/4 as much space as acid pickling. In others, labor requirements are reduced as much as 50%. In still others, Wheelabrating saves not only cleaning time but speeds production by permitting straight-line operation not possible with acid pickling. In addition, Wheelabrating removes no virgin metal, thus saving metal. And elimination or reduction of acid pickling saves on acid requirements and minimizes acid disposal problems and expense. While making all these savings, Wheelabrating also provides a matte finish that has proved superior for cold working.





FOR SPECIFIC EXAMPLES OF SAVINGS send today for your free copy of Bulletin 128-D. Actual case histories of Wheelabrator installations show how savings are achieved. Shown above is a report in this highly-informative, thoroughly-illustrated 8-page bulletin.

WHEELABRATOR
CORPORATION
510 South Byrkit Street Mishawaka, Indiana

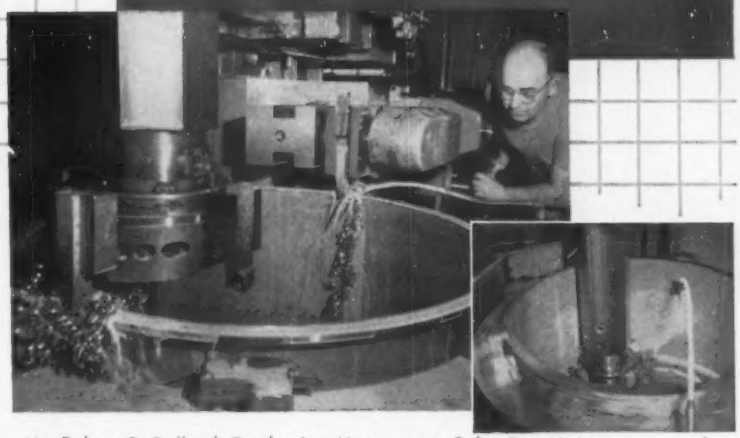
PRODUCTION "at all time Peak"

with BULLARD

MAN-AU-TROL VERTICAL TURRET LATHE

MODEL 75

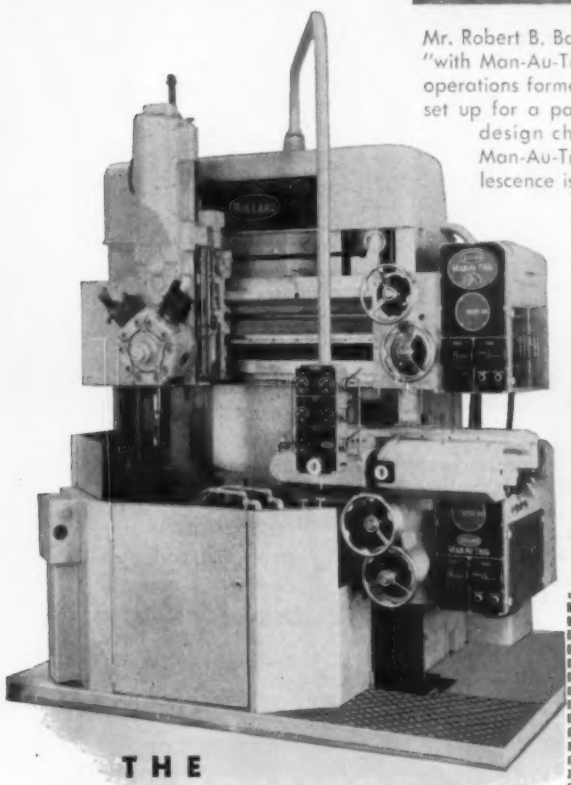
Solar Aircraft Company of Des Moines, Iowa and San Diego, California, has found the versatility and flexibility of the Bullard Man-Au-Trol V.T.L., Model 75 a distinct advantage in the machining and fabricating of various jet aircraft engine parts and assemblies.

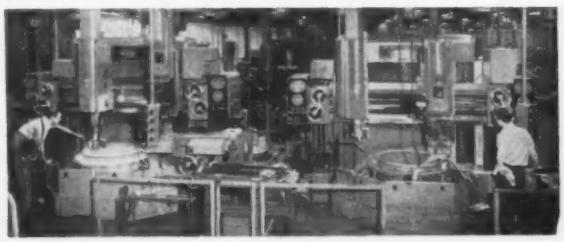


Mr. Robert B. Ballard, Production Manager at Solar-Des Moines, reports that "with Man-Au-Trol, Model 75, it is possible to do a multitude of machining operations formerly requiring numerous expensive machines which had to be set up for a particular operation, so limited in scope, that an engineering design change either obsoleted the tooling or the machine. With Man-Au-Trol, Model 75, because of its wide range of functions, this obsolescence is greatly reduced — if there is a design change, only a new set-up is made — not the purchase of a new multi-thousand dollar piece of machinery."

These same advantages can be applied to *your* manufacturing methods —

Ask your Bullard Sales Engineer for complete details.





THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

THE BULLARD COMPANY
286 CANFIELD AVENUE • BRIDGEPORT 9, CONNECTICUT

Please send me a copy of the
NEW MAN-AU-TROL V.T.L., MODEL 75 CATALOG

NAME.....

COMPANY..... POSITION.....

ADDRESS.....

CITY..... ZONE..... STATE.....

Can I afford a Towmotor?



You can!

Typical savings produced by Towmotor Fork Lift Trucks are revealed in recent Certified Job Studies which show that: For one company, one Towmotor Fork Lift Truck paid for itself in 10 months. For another company, six Towmotor units saved $50,000 in a single year.

It's an amazing fact that most companies now using outdated materials handling methods are, through hidden costs, already paying the price of Towmotor equipment. To discover how you can save money on your materials handling, call your Towmotor representative today! . . . or write for Certified Job Studies covering your industry. TOWMOTOR CORPORATION, Div. 1512, 1226 E. 152nd St., Cleveland 10, Ohio.

Read how a Manufacturer of metal castings cut over-all handling costs 60%. Ask for Job Study #108

America's ***best engineered*** *fork lift truck*

TOWMOTOR
THE ONE-MAN-GANG®

THERE'S ONLY ONE FORK LIFT TRUCK CALLED TOWMOTOR

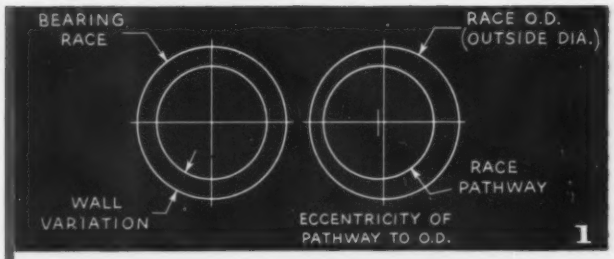
ONE OF A SERIES . . .

What makes a Hyatt roller bearing good?

CLOSE CONTROL OF INTERNAL DIMENSIONS and CLEARANCES

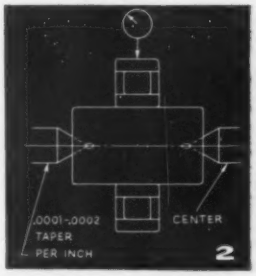
The running accuracy and smoothness of a HYATT roller bearing is governed by the tolerances of its internal dimensions and its internal clearance. Internal dimensions include concentricity of race diameters, uniformity of roller diameters and squareness of all radial and axial surfaces.

Because the internal dimensions of HYATT Hy-Roll bearings are so closely controlled, HYATTS run smoothly and quietly, last longer, and prevent equipment trouble due to excessive heat and vibration. You will find full selection and application data in HYATT General Catalog 150, or call your nearest HYATT Sales Engineer. HYATT Bearings Division, General Motors Corporation, Harrison, New Jersey. Sales offices at Harrison, New Jersey; Pittsburgh, Pennsylvania; Detroit, Michigan; Chicago, Illinois; and Oakland, California.



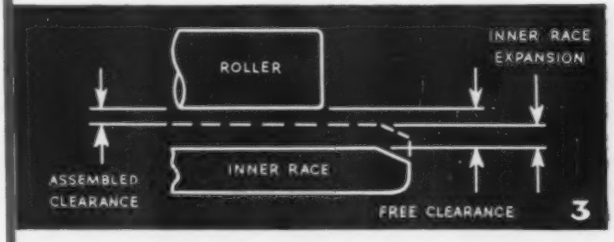
CONCENTRICITY OF RACE DIAMETERS

Concentricity of race diameters is usually defined in terms of wall variation, Figure 1, of the individual races, and radial run-out of the assembled bearing. The latter is generally a user's inspection where the bearing is mounted on an arbor, Figure 2, having a slight taper (.0001″ to .0002″ on the diameter per inch of length) and the radial run-out indicated as shown by turning either the arbor or the outer race one revolution while the other member is held stationary and noting the difference between the minimum and maximum readings. Industry standards are available which indicate what values are acceptable.



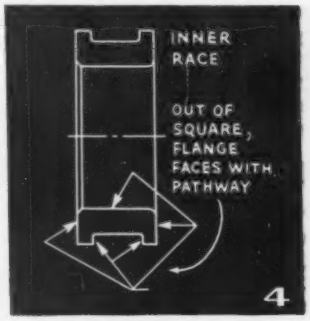
UNIFORMITY OF ROLLER DIAMETERS

Roller diameter uniformity, which is also necessary to running smoothness, is obtained by segregating the rollers into diameter variation classes of .00005″, .0001″ or .00015″, depending on bearing size and quality grade and assembling only rollers of the same class into a given bearing. Rollers are then matched with races which are segregated in a similar manner in order to control the diameter over or under the rollers, which governs the internal clearance spread of the mounted bearing. Figure 3 (magnified)



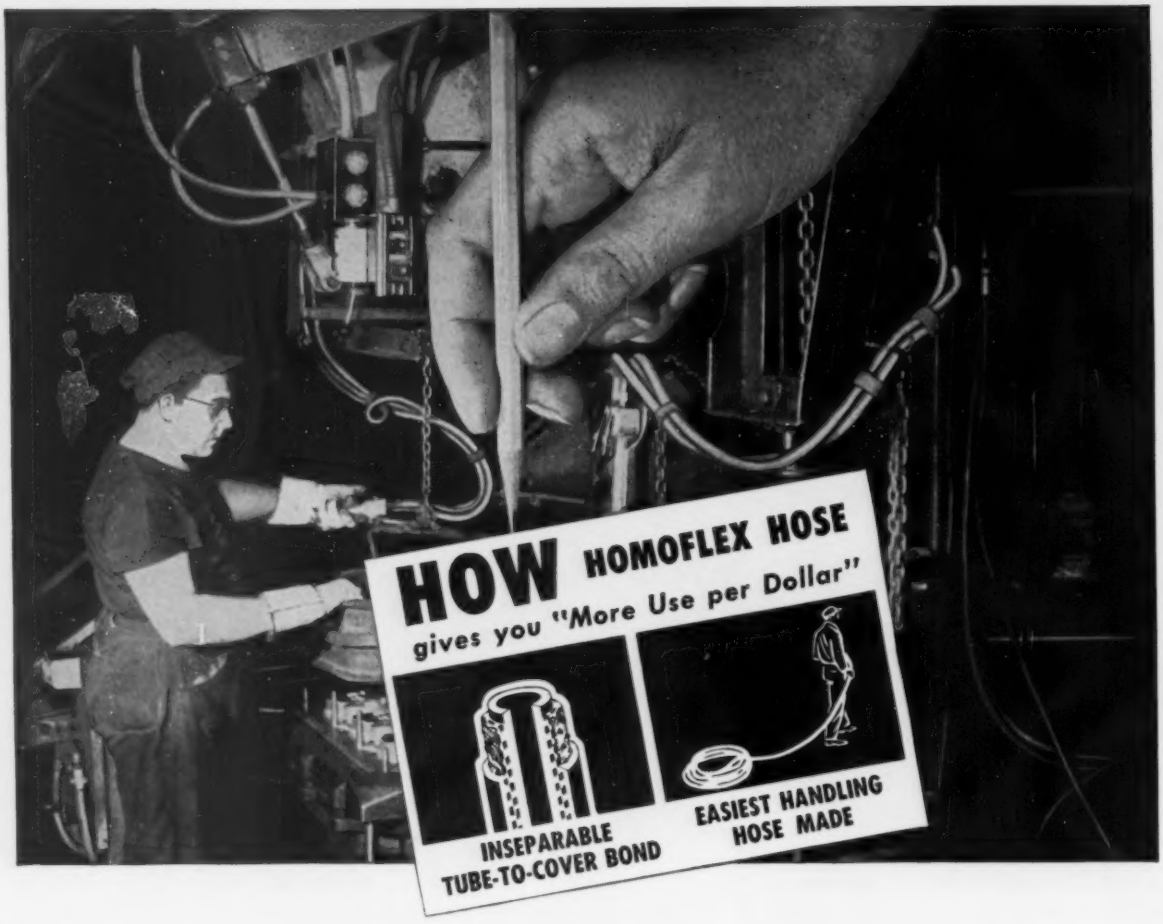
SQUARENESS OF RACE AND ROLLER ENDS AND FLANGE FACES

Figure 4 indicates the race surfaces which must be square with each other within minute tolerances depending on the grade of the bearing. This is to prevent roller skewing with consequent heating and noisy operation. The roller ends must also be square with the diameter for the same reason. End square tolerances are usually less than .001″ for the most frequently used sizes.



GM GENERAL MOTORS

HYATT HY-ROLL BEARINGS FOR MODERN INDUSTRY



This Rugged Hose Handles Like a Rope!

Strong enough to stand up under the toughest job conditions, Homoflex Hose is light in weight and as flexible as a rope. It's the easiest handling hose made for use with air, water, and other fluids and gases! The exclusive Homoflex construction increases hose life, too . . . assuring you "More Use per Dollar" for every length you buy.

Homoflex Hose has no pre-set twist. It is mandrel-made to coil and uncoil freely in any direction without kinking. This eliminates the strain that could otherwise lead to costly internal damage and hose rupture. An exclusive process creates a homogeneous, inseparable tube, strength member and cover bond that combines maximum flexibility with rugged strength and durability. Homoflex Hose reduces hose costs because its easier handling features enable workers to get more work done . . . and because it lasts longer. Couplings are easier to fit, too, because Homoflex Hose maintains uniform inside diameters.

Ask your R/M representative about easy handling Homoflex Hose for your operations. He'll also tell you how other types of R/M Hose for general and special purposes do a better job, longer . . . give you "More Use per Dollar".

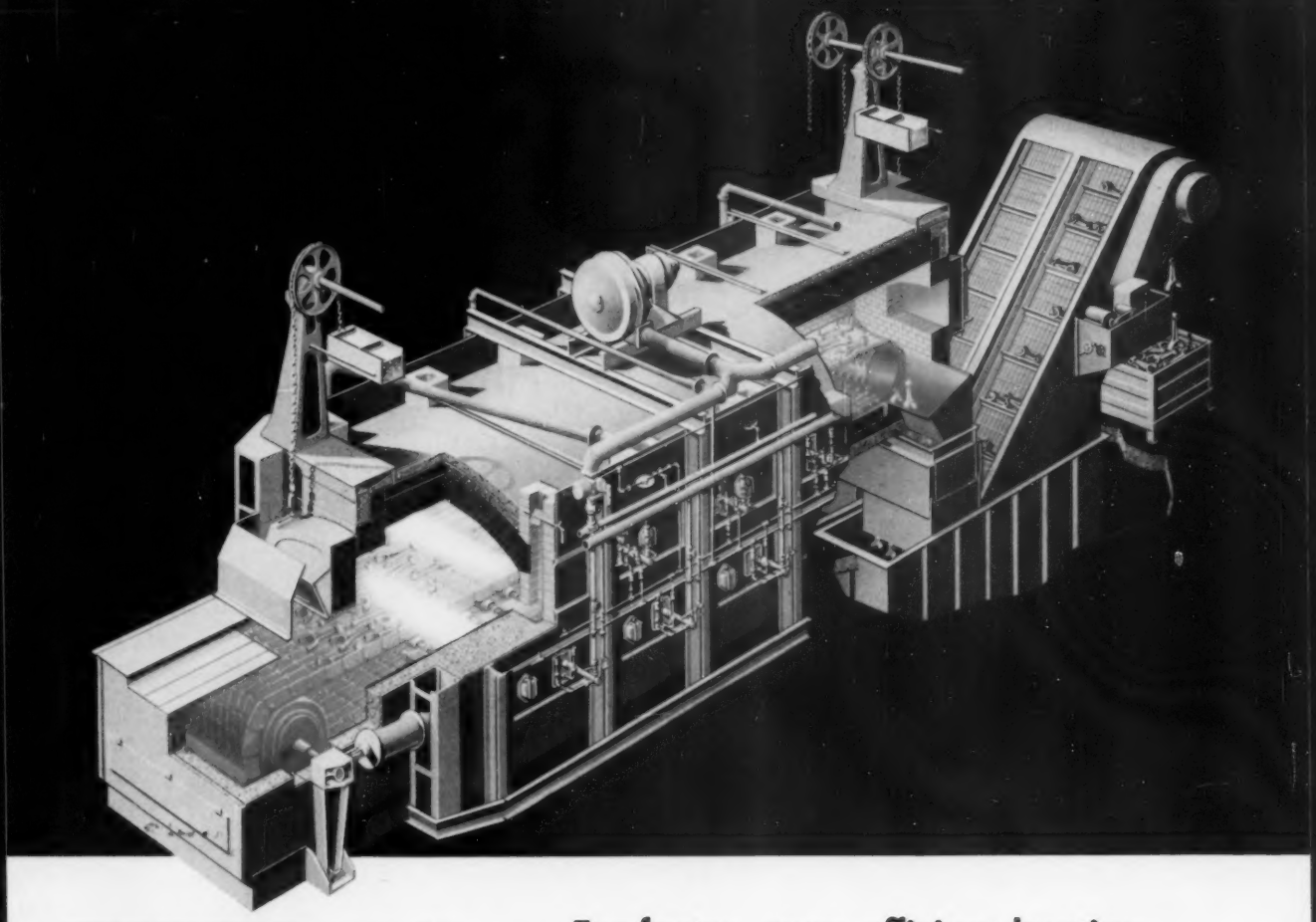
RM 847

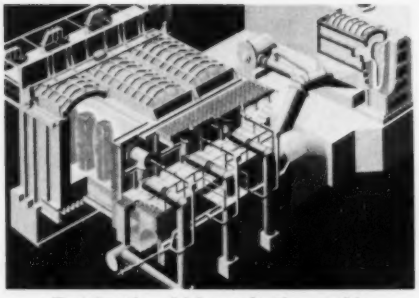
MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

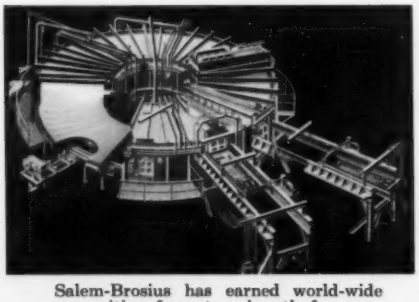


Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Laundry Pads and Covers • Bowling Balls





Fast heating, high production soaking pits are a specialty of Salem-Brosius.



Salem-Brosius has earned world-wide recognition for rotary hearth furnaces.

For faster, more efficient heating or heat-treating furnaces, it pays to call on Salem-Brosius

Throughout the entire metals industry, Salem-Brosius designed furnaces are doing an efficient, low-cost job of heating and heat treating. The hardening furnace shown above in cut-away scale drawing is typical of high production heat treating furnaces by Salem-Brosius.

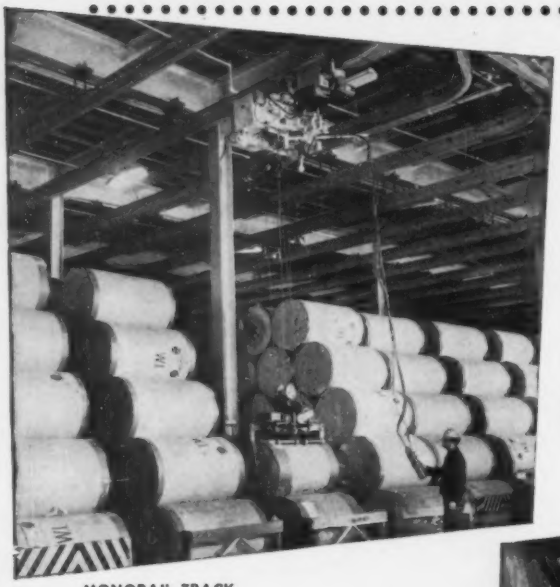
Gears, connecting rods, crankshafts and other critical forged parts are hardened in this type of furnace. Parts are heated to hardening temperature, soaked at this temperature for a controlled length of time and quenched—all automatically. Parts are also discharged automatically from the quench. This gas-fired, chain-belt, conveyor-type furnace is designed for high production, low maintenance and efficient operation—typical of all Salem-Brosius furnaces. Flexibility of time-temperature control reduces labor cost, assures product uniformity and permits variations of the heat-soak cycles.

For any heat treating job—hardening, annealing, normalizing, aging, solution heat treating, and other forms—consult Salem-Brosius for the best in furnace equipment.

SALEM-BROSIUS, INC.

CARNEGIE, PENNSYLVANIA

IN CANADA: SALEM ENGINEERING LTD. · 1525 BLOOR STREET WEST, TORONTO 9, ONTARIO



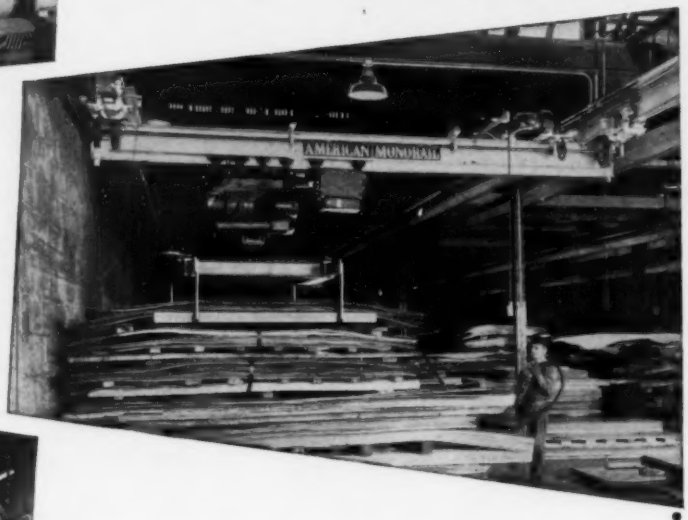
MONORAIL TRACK

use

MONORAIL SPECIFICATIONS

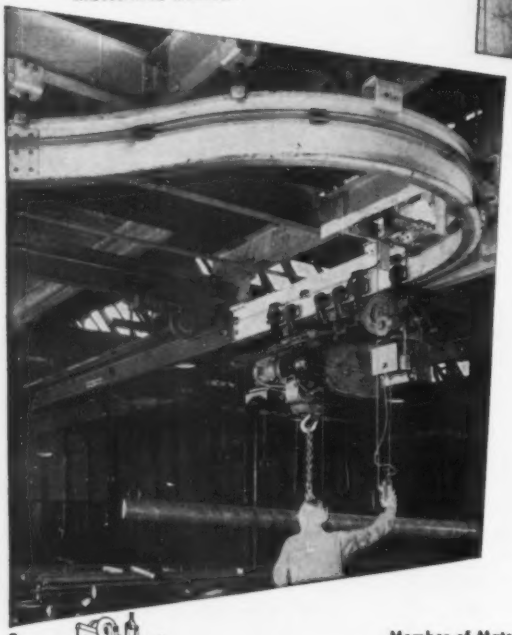
for

MAXIMUM SAFETY MINIMUM MAINTENANCE



MONORAIL CRANE

MONORAIL CARRIER



By following the guide prepared by members of the MonoRail Manufacturers Association when purchasing materials handling equipment, you are assured of getting maximum safety and minimum maintenance and still satisfy your operating requirements.

The guide represents the efforts of the combined experience of all the engineers of the association members. The specification guide has just been published.

A copy of these specifications will be forwarded on request. Write also for a copy of the American MonoRail Bulletin C-1 describing hundreds of successful solutions to handling problems.

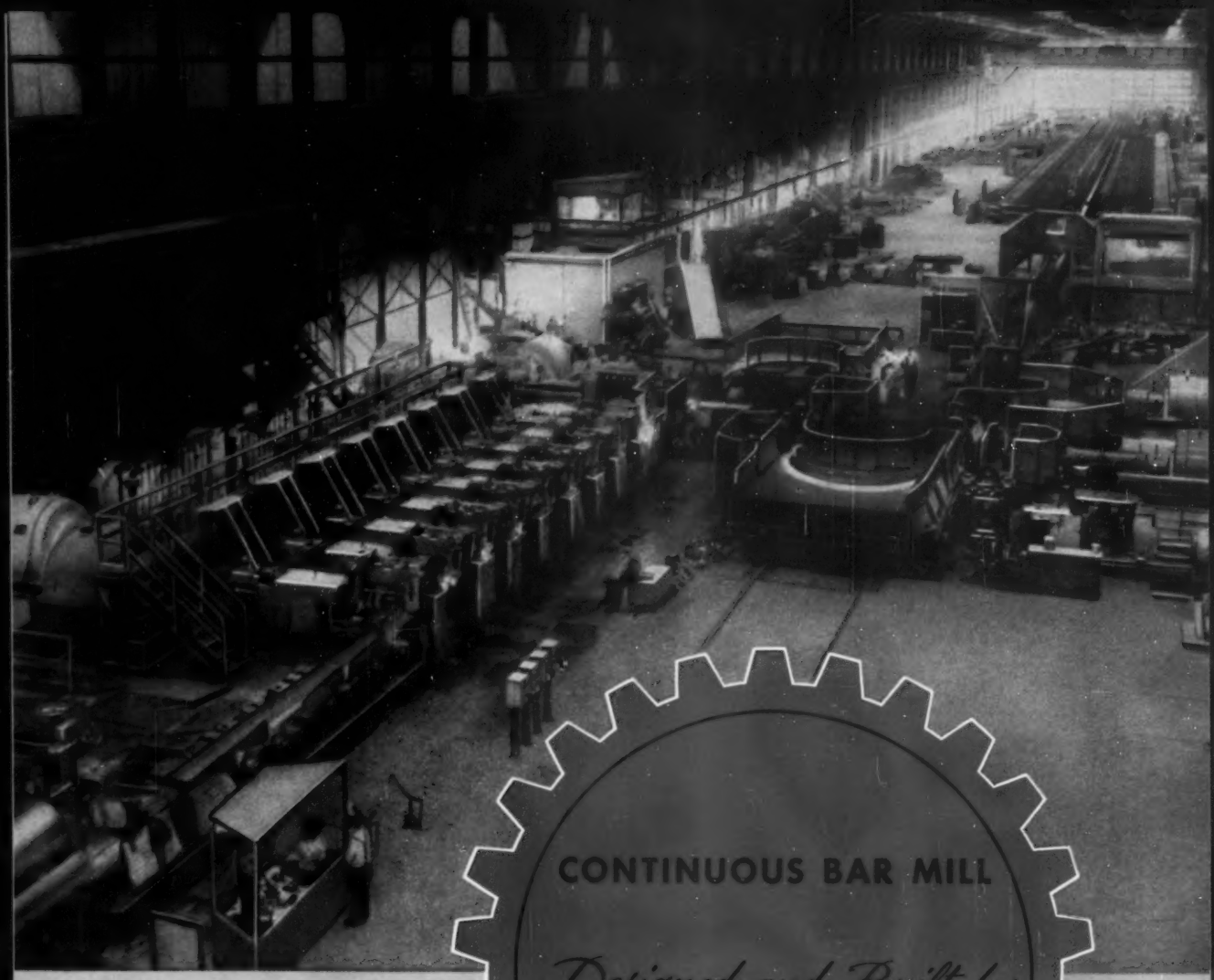
Member of Materials Handling Institute — MonoRail Association

AMERICAN OVERHEAD HANDLING EQUIPMENT

MONORAIL COMPANY

13103 ATHENS AVENUE
CLEVELAND 7, OHIO

[IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.]



CONTINUOUS BAR MILL

Designed and Built by

UNITED



Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses, and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at: PITTSBURGH • VANDERGRIFT • YOUNGSTOWN • CANTON
WILMINGTON (LOBDELL UNITED DIVISION)

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

UNITED *can serve you no matter where in the world you are*



TUBING

every kind in stock

- Seamless Mechanical
- Welded Mechanical
- Fluid Power Tubing
- Structural Tubing
- Boiler Tubes
- Stainless Steel Tubing

You'll get quick delivery on steel tubing for every purpose from Ryerson. The nation's largest tubing stocks —fast, accurate cutting service . . . and an experienced staff of tubing specialists—all are at your command.

So call Ryerson for everything in tubing and tubing service, whatever kind or quantity you need.

RYERSON STEEL

In stock: Bars, structurals, plates, sheets, tubing, alloy and stainless steel, reinforcing bars, machinery & tools, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

NEWSFRONT

SBA Wants Larger Allowance

Officials of the Small Business Administration want a whopping increase in funds for fiscal 1957—perhaps as much as 100 pct. They'll have White House support in asking for it. Personnel-short, they want bulk of funds for a bigger staff to handle flood of applications from businessmen. Congress will be skeptical, though some increase will probably be granted.

Freight Cars: Easing Seen Unlikely

The freight car pinch around Pittsburgh is easing. One major road has been scouring other regions for gondola cars standing idle; expects to be out of the woods by the end of November. Any ease-up is apt to be short-lived, though. Steel mills are alerting railroads to get set for unusually heavy East Coast/inland ore movements this winter.

Oxygen In Steelmaking Grows

Oxygen in steelmaking continues growing at an unprecedented rate. Now under consideration: an oxygen producing plant capable of turning out over 400 tons a day. Plant's primary role, at this early stage, would appear to be to satisfy needs of a single blast furnace in the East making ferroalloys.

Where High Scrap Value Hurts

Because nickel-bearing stainless steel scrap sells for about as much as new metal, Detroit fears a short-supply squeeze. No. 1 use for the grade is wheel covers. Fabricators could go to type 430 or 200 series—both proven satisfactory. But they prefer 300 series because of the enormous return on process scrap.

Meets Extreme-Cold Requirements

Recent tests make a good case for titanium's use for extreme low-temperature work. With carbon and alloy steels, welded pressure vessels handling liquid oxygen at −321° F sometimes fail from embrittlement. Tests run on titanium and several of its alloys show it possesses excellent strength, notch sensitivity and high ductility at −321°F.

Raise Your Sights On Weapons Costs

Weapons costs will sprint ahead to levels two or three times higher than today's. High-priced missiles and atomic-propulsion programs have been relatively limited in size; they'll grow as weapons technology advances. Forecasts of future price tags on naval vessels gives a good idea. Estimates are a fleet of present size, 80 pct up-to-date by 1970, would call for a $5-billion annual building program.

What's Flexible Tube Consumption?

About 1.5 million ft a year. That's the amount of flexible tubing metalworking companies buy per year for in-plant use, exclusive of original-equipment applications. Recent survey by THE IRON AGE shows about 60 pct of this is of less than 2-in. diam. Biggest single user (250,000 ft a year): the steel industry.

Titanium: New High-Heat Lubricant?

Potential new use for titanium may be as a solid lubricant in machinery operating at high temperatures. Australian experimenters claim that finely-ground titanium disulphide powder is an excellent lubricant at temperatures exceeding 1800°F, under non-corrosive conditions. Even in corrosive atmospheres, powder is said to remain stable up to 500°F.

For Sharper Aerial Reconnaissance

Photographic compromise of developing roll-film "for the average" may be on way out for the Air Force. A new processing machine takes a 200- to 400-ft roll of aerial film, sizes up each negative individually, and gives it the proper development to bring out vital reconnaissance details. Sealed process operates in daylight, handles up to 3000 negatives per day.

Something New Under The Sun

A solar furnace "significantly different" from existing units will be ready for research laboratories next year. Furnace is now being built by a major New England consulting research firm, for its own investigations into how materials function at temperatures to 3500°F.

pre-planned



In estimating production costs, one of the items a metal fabricator takes into account is the cost of steel. As important as this is, it is sometimes good economics to pay more for steel, but pay less in the end for the fabricated part. The cost of down time on expensive forming equipment, the cost of idle labor, the cost of reprocessing defective parts, may well exceed the cost of the extras built into restricted specification steel, which will eliminate these unplanned-for costs.

CMP restricted specification cold rolled strip steel can be pre-planned to minimize production delays and produce for you the production cost you need. We will welcome the opportunity to explore with you the cost-saving potentials in your manufacturing processes which may be available to you by use of **CMP** restricted specification cold rolled strip steel.

CMP

WHERE YOU CAN GET
SPECIFIC SPECS
FOR
SPECIFIC JOBS

LOW CARBON, ELECTRO ZINC COATED,
HIGH CARBON, TEMPERED SPRING STEEL,
STAINLESS AND ALLOY

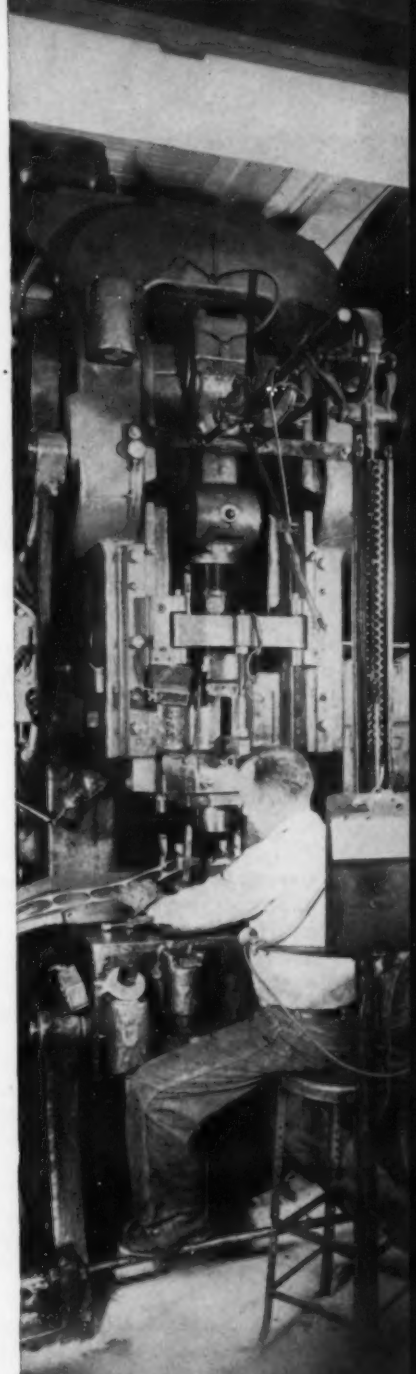
THE COLD METAL PRODUCTS CO.

GENERAL OFFICES: YOUNGSTOWN, OHIO
PLANTS: YOUNGTOWN, OHIO & INDIANAPOLIS, IND.
SALES OFFICES: New York • Cleveland • Chicago
Indianapolis • Detroit • Los Angeles • San Francisco

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Costs Prod Mills Toward Steel Price Hike

Rising material costs, runaway scrap prices apply pressure . . . Expected cost-of-living wage boost adds more incentive . . . If base prices hold, extras may go up $3 a ton average—By *G. J. McManus.*

◆ STEEL USERS had better brace themselves for higher steel prices after the turn of the year—if not before. The mills are fighting a losing battle against rising cost. The only way they can recoup is by raising prices.

Chances are that steel base prices will remain as they are until next July 1 when wages rise under the second phase of the three-year contract with steel labor. But if base prices remain the same, steel extra charges will go up—perhaps as much as $3 per ton on the average—in the interim.

In addition to runaway scrap prices and other material cost increases, the mills face the prospect of a cost-of-living wage boost Jan. 1 under the same agreement that calls for a seven-cent-an-hour increase next July 1. The Jan. 1 increase could be as much as four cents an hour.

The way things are going, the cost of making steel on Jan. 1 will be a conservative $5 a ton more than it was last summer, when current prices were set. Even before the cost surge, steelmakers were saying prices were too low, by a good $4. Now the pressure for a boost is boiling over.

As one producer puts it: "No mill can stand still for a wage increase of three or four cents an hour." (If the cost-of-living index holds at its present level, steel wages go up 3¢ an hour Jan. 1).

Cushion Absent

He explains his company's position this way: Profits during the first half of 1956 were up over last year's. Net profit as a percentage of sales also increased. But this was due to bigger sales volume. Had volume remained at 1955 levels, profit percentages would have declined.

By midyear, rising costs had pushed the mill's breakeven point to a level that was considered unhealthy. The steel price increase of $8.50 a ton last August put costs and income back in normal balance. But it provided no cushion for anticipated increases in the mill's costs.

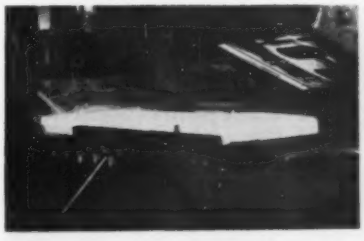
Following the strike, costs jumped. There were the expected rises in equipment and materials. Rolls went up 10 pct; pig iron advanced $2.50 a ton. Ferrochrome moved up 2¢ a pound. Things like grinding wheels and steel castings went up.

On top of this, scrap prices zoomed. The price of No. 1 heavy melting steel scrap jumped $15—from $44.83 a ton on July 2 to $64.33 on Nov. 27, based on THE IRON AGE steel scrap composite. For special grades, the rise was even more startling. Chrome nickel scrap climbed from $450 a ton in the summer to a current price of $525.

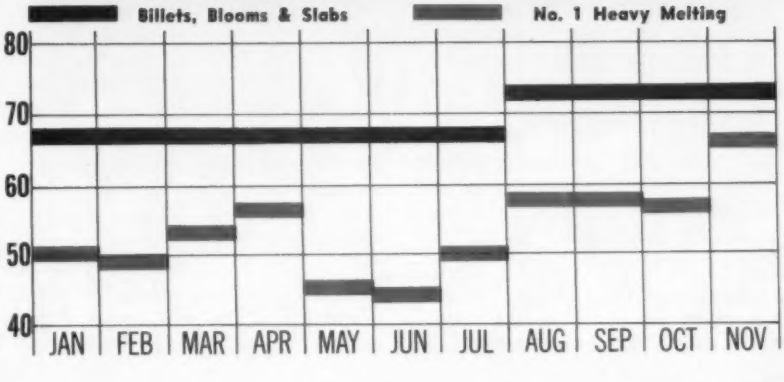
Because of the timing of price

Why Steel Price Pressure Grows: Scrap Versus Billets At Pittsburgh

1956 Prices in Dollars







increases and inventories of lower-priced supplies, the climb in mill costs has been gradual. But today one mill figures its cost and income picture is already back on the shaky basis of the mid-year point.

Two more big cost jumps are on deck. The new steel contract provides that if the Nov. 15 cost-of-living index is between 117.5 and 117.9, wages will go up 3¢ an hour on Jan. 1. The index moved up to 117.7 in October and many authorities feel the November figure (published about Dec. 20) will be higher. If it is between 118 and 118.3, the steel wage hike will be 4¢ an hour.

A 3¢ wage hike would add about 60¢ to the cost of a ton of steel.

An even bigger blow for the mills could be the proposed 15 pct increase in rail rates. Taken with higher rates for Lake shipping, this would add $2.60 a ton to the cost of steel by Jan. 1.

Within the steel industry, other costs vary from mill to mill. For example a mill that mines its own iron ore and limestone was hit with wage increases of 20¢ an hour this summer. A mill that buys ore has had no cost increase; prices are set for the whole shipping season.

In addition, the leapfrog pattern of steel pricing makes it difficult to assess costs at a particular time. Normally, the mills set prices that give them some leeway on costs. Immediately following a price increase, they figure to be a little ahead of the game. Then toward the end of the price year, costs catch up with them.

This year costs caught up fast.

Putting the Heat on Steel Prices

		Added Cost Per Steel Ton
Scrap	Up to $64.33 from $44.83	$2.00 plus
Freight	Up 15 pct*	2.60
Coal	Up 35-40¢ per ton	.40
Wages	Up 3¢ per hr (Jan. 1)	.60
	TOTAL	Over $5.00

AND IN ADDITION:

Limestone	Wages up 20¢	Ferro Molybdenum	Up 14¢ per lb
Iron Ore	Wages up 20¢	Ferromanganese	Up 2¢ per lb
Ferrochrome	Up 20¢ per lb	Ferrovanadium	Up 10¢ per lb
Electrolytic chrome metal	Up 4¢ per lb	Aluminum	Up 1¢ per lb
Pig Iron	Up $2.50 per ton	Rolls	Up 10 pct
Molybic Oxide	Up 8¢ per lb	Steel Castings	Up 10 pct

*If requested increase goes through.

Another Try for OTC

The Eisenhower Administration again will next year attempt to persuade Congress to put the U. S. in the proposed Organization for Trade Cooperation—a UN-type of group to be set up to administer international trade-tariff treaties. The outlook for success is not particularly bright.

Opposition to OTC is strong among groups which generally favor high tariffs to protect domestic industries. Opposition also crops up among some congressmen who generally favor free trade but oppose OTC because they fear U. S. participation in such an organization would take away this country's sovereignty in setting its own tariffs and quotas.

Backers of OTC claim it would not mean the U. S. would relinquish any of its prerogatives, nor bring any tariff reductions which Congress had not first authorized. But opponents as yet do not appear to be convinced.

Inland Appoints Arbitrator

Appointment of David L. Cole as permanent labor arbitrator was announced by Inland Steel Co. in agreement with United Steelworker union locals in the company's plants. Selection of an arbitrator was called for by the firm's three-year labor agreement with United Steelworkers, signed August, 1956, and it extends through the life of the contract expiring in June, 1959.

As permanent arbitrator, Mr. Cole will decide grievances at all the company's Steelworker organized plants and operations. He was a member of the presidential fact finding board which conducted hearings in 1949 in the dispute between the USW and the steel industry over insurance, pensions and wages. He was appointed director of the Federal Mediation and Conciliation Service in 1952.

Designs Special Valve

Special automatic valves for use at a guided missile installation have been designed by John Kilmer, chief engineer, Golden-Anderson Valve Specialty Co., Pittsburgh. The design is for a surge relief valve with auxiliary electrically-controlled pilots to protect the large water distribution system used in cooling the launching pad.

Other Golden - Anderson valves will also be used in this cooling operation at the 1500-mile missile installation at Patrick Air Force Base, Florida.

DUES: Revolt Rocks the Union Boat

Unhappiness over dues hike reflects the intra-union opposition to McDonald . . . Leaders, not worried about dissenters succeeding, see move as part of a long-range campaign . . . Rarick runs for president.

◆ ALL IS NOT beer and skittles within the United Steel Workers of America. But David J. McDonald, the union's president, appears to have the situation well in hand.

Nevertheless, the revolt stemming from last September's $2-a-month dues increase, although localized, is symptomatic that forces within the union opposed to Mr. McDonald are ready to use every opportunity to fan the flames.

Actually, the revolt over the dues increase will get nowhere. But McDonald's enemies are likely to exploit episodes of this sort and may use it to cause trouble at the union's next biennial convention in 1958.

Fence Mending

Meanwhile, Mr. McDonald and his top aides will be out mending their political fences while at the same time mapping plans for union demands when the present three-year contract with steel producers expires. The union's executive committee has scheduled six regional two-day meetings with USW leaders in New York, Philadelphia, Columbus, Chicago, Salt Lake City, and San Francisco. Another meeting may be held in Montreal.

These regional affairs were scheduled primarily to thresh out union problems and to talk over probable future union demands and activities, such as the organizing of office workers and the strategy for achieving a shorter work week. But McDonald will be doing some politicking, too.

The crackdown on the dues-increase protestants came last week when the executive board decided that the recalcitrants were out of line in seeking support for a special convention to re-consider the dues question. The board also accused the dissenters of "promoting dual unionism"—a serious charge. Mr. McDonald also warned that the dissidents might be tossed out of the union if they continue their activities.

Convention Doubted

The rebels contend that the dues increase, adopted at the union's Los Angeles convention, was too abrupt; that it was "railroaded" through at the convention. They have been working to secure local resolutions calling for a special convention on the matter.

Such a convention could be called if 25 pct (about 700) of the locals request it. But it's doubtful that the protest group could line up the required number. Even if they did, the International union probably would kill the move on constitutional grounds.

Closely linked with the dues protest is the candidacy of Don C. Rarick of Local 2227, U. S. Steel Irvin Works, near Pittsburgh, for the union's presidency. Mr. Rarick is chairman of the Dues Protest Committee. His supporters are seeking the backing of the 40 locals required to put his name on the ballot against Mr. McDonald at the union's quadrennial referendum next February.

Things to Come?

Mr. Rarick has already won the endorsement of several locals, mainly around Pittsburgh, in sparsely-attended sessions. But he is not regarded as a serious threat to Mr. McDonald. The real concern of top union leadership with his movement seems to come from two thoughts:

(1) That the dues issue is not a



SPEARHEADING drive against dues increase is Don C. Rarick (right), Local 2227, Pittsburgh, chairman of Protest Committee. Rarick also campaigns for union presidency. (Pittsburgh Sun-Tele. photo).

legitimate one and should be squashed.

(2) That Mr. McDonald's position may be weakened for the time when more powerful opposition tries to unseat him—probably in the election after the forthcoming one.

How effective the board's action will be in killing the dues issue is a question. Whether the opposition abides by the ruling or not, charges of steamroller tactics seem certain to be raised.

In the six regional meetings scheduled for International officers, points to be covered include: the recent contracts signed with basic metal producers and others; pension and insurance agreements; SUB agreements; arbitration; and incentive and job classification.

On Tour

Union spokesmen point out that in view of the sweeping, three-year contracts signed with industry, it is logical to hold field meetings and to discuss problems with district men. This is true but it is also true that the tour will give Mr. McDonald a chance to renew and strengthen ties with his field force.

The current prominence of internal squabbles does not mean the Steelworkers have dropped their drives for shorter hours, broader membership, racial integration and the like. A statement issuing from the Pittsburgh meetings says steps were taken to implement these. The district meetings will devote one afternoon to "future goals."

ODM Readies Controls

The Office of Defense Mobilization is asking the Labor Dept. to develop a national wage and salary stabilization program for use in case of an emergency.

Orders are to develop measures covering labor force expansion and maximum use of the civilians for war production, if needed. It will include ways for developing production skills, maintaining labor peace, establishment of job priorities and an enforcement program. It is one of the last mobilization programs to be handed out by ODM.

PRODUCTION

DETROIT: What Happened In '56

Sales and production snafus hurt the auto firms this year . . . Steel and other suppliers suffered . . . Part of the trouble was overconfidence in appeal of '56 cars.

◆ WHAT HAPPENED to Detroit in 1956? Steel producers and other suppliers to the automotive industry have been asking that question for months. Basically, there's been nothing wrong that a few sales wouldn't have cured.

But the situation goes back even farther than the downtrend in sales of '56 models. What happened was this:

The automakers overestimated the sales appeal of the '56 models. So they stocked up heavily on steel and waited for the rush to the show rooms. It didn't come. The buying public turned thumbs down on the new cars.

Production Problems

Meanwhile, the steel strike came along in July, and that helped cut back inventories, which at one stage were running a full 60 days. Some companies were sitting on 90 day inventories of some steel products. But the combination was such that steel inventories were still relatively heavy as production of the 1957 models began.

Then the industry ran into more troubles. Detroit's production lines failed to mesh in their usual fashion. Several companies had serious snafus on critical parts. For instance, one of the Big Three had difficulty with its frames. A second firm fell so far behind that 800 dealers were without cars to show off the day of the public announcement.

This was an ironic turn for the dealers, who several months ago were complaining in Washington against the manufacturers for overloading them with new cars. Last month they were beating at the producers' doors for more autos, but to no avail.

This had an effect on all the industry's suppliers, particularly steel. Detroit has been blowing hot and cold on steel all year. Producers have postponed delivery of some orders one month, then asked the mills to make up this tonnage the following month.

Looking Up

But it looks as though the worst is over for steel and other suppliers. The new models appear to be going over well with the public. They should. The 1957 cars have new styling, and outstanding engineering features. Buyers who made 1955 a record year are about due for a trade-in.

On the basis of what Detroit is doing about January steel requirements, it seems that the drought is about over. At least one company has asked its steel supplier to increase its original January order by 40 pct. Another wanted to hike its January tonnage but the mill was forced to turn him down.

More Aluminum

Federated Metals Div. of American Smelting and Refining Co. will build a large secondary aluminum smelter. The plant, to be built at Alton, Illinois, will have an annual capacity of 72 million lb of alloy ingot.

It will be among the largest plants ever built to handle aluminum scrap metals and will double Federated's present aluminum alloy production.

To handle the output of the new smelter, Federated will establish new sales and purchasing divisions at Alton. A special purchasing organization will acquire the large scrap tonnages required. Construction will begin early in 1957. When capacity is reached about one year later, Federated says it will be the world's largest smelter of secondary aluminum.

STEEL DRUMS: Re-use Saves Millions

The still-growing steel drum reconditioning industry is dwarfing its parent, the new drum manufacturing industry . . . Refinished drums reduce packaging costs up to 75 pct . . . Petroleum, chemicals big users.

◆ ANYONE WHO DISCARDS an empty metal drum today is throwing away money.

One of the nation's newer industries—the metal drum reconditioners—is paying hard cash for empties. Standard 55-gal. 18-gage steel drums are bringing up to $3 each.

By putting these containers into reusable shape, the reconditioners are reducing packaging costs for drum users, conserving at least one million tons of hot-rolled sheet steel a year and, of course, making a profit in the exchange.

Ten-Trip Average

Twice as many reconditioned drums were used this year as were new drums. The reconditioners are turning them out at a rate of 22,400,000 a year—compared with 17.5 million new 55-gal drums produced in 1955. The 55-gal size represents about 95 pct of all drums used.

The cost of a new bung-type drum in the New York area, for example, is $6.50. A reconditioned drum costs $4.50 to $4.75. That's a saving of 3½ to 4 cents a gal on packaging costs.

And considering that the average drum is now reused for 10 trips, drum costs can be lowered to as little as $2.10 per trip.

Oddly enough, prior to World War II the reconditioning industry was almost non-existent. About 3000 drums per day were being done—over in the New York-New Jersey area in 1940. Today, the area's daily production is 25,000.

During the war, the War Production Board—bent on saving steel—limited purchase of new drums to companies who were reusing old ones. Almost overnight the reconditioning industry shot up. Machines were devised for de-denting drums by use of air pressure, for tumble-cleaning and shot blast cleaning drum interiors, stripping exterior coatings, straightening and sealing chimes. Conveyor-fed enameling ovens became standard equipment.

The modern plant is geared to recondition two to three thousand drums per day. About 250 independent and 150 captive reconditioners are operating in the U. S. and Canada, compared to 43 producers of new drums.

These firms have organized their own trade group, the National Barrel and Drum Assn., Washington, D. C. Its president is Morris Hershson.

The reconditioners group their finished drums into three grades:

No. 1, its prime package, is almost indistinguishable from a new one; No. 2, in almost as good shape as a No. 1, but is distinguishable as reconditioned; No. 3, usually the last trip for a drum. It is used for low value end-product use, such as asphalt or non-edible fats.

The industry is divided into two types of operations. The first deals in the purchase, reconditioning and sale of used drums. The second reconditions on a service basis drums that belong to others.

A move on foot to popularize 18-20-18 gage drums; that is, 18 gage top and bottom and 20 gage sides, is being opposed by the reconditioners. Although the use of thinner, 20 gage steel would effect some steel savings, these drums are not durable enough, and are harder to recondition, the industry claims.

Drum Rebuilders Beat Rapid Production Tattoo



◆ PUTTING a used steel drum back into reusable shape has become a highly mechanized industry. Each drum is automatically chime-sealed and straightened, stripped down to the raw steel both inside and out, tested, dedented, coated with a high-backed enamel, and shipped to the filler —as good as new.

In the dedenting operation (left), a machine pumps compressed air into the drum. Dents pop out in a matter of seconds. Interiors of open head drums are cleaned by shot blast method; bung-type drum interiors get revolving jet spray treatment. Baked-on enamel finishes are made possible by automatic painting equipment and bake ovens. A modern plant turns out 2000 to 3000 reconditioned drums a day.

Are You Getting Your Share of Government Business?

Last year 76.4 pct of GSA's standard items were purchased from small businesses employing less than 500 people.

ANNUAL PURCHASES INCLUDED:

	In Millions of Dollars
Office supplies	50
Furniture	35
Fuels	27
Chemicals	14
Photographic equipment	12

	In Millions of Dollars
Instruments and lab equipment	8
Miscellaneous	8
Medical and dental supplies	5.8
Paper products	5
Cleaning equipment	5

	In Millions of Dollars
Brushes, paints, etc.	5
Textiles and leather	4.5
Electrical supplies	4.5
Hand tools	3
Hardware and abrasives	2

SMALL BUSINESS: A Lead to $2 Billion

Government contracts go begging because small businessmen aren't informed . . . Conferences are aimed at educating small plants on availability of government work—By *T. M. Rohan.*

◆ AS A SMALL businessman, are you getting your share of government business? Could be that you're not. Because the Small Business Administration says that small manufacturers are letting about $2 billion in government contracts get away from them each year.

To give small businesses a chance to get a slice of the contract pie, SBA is conducting a series of "business opportunity" conferences throughout the country. At these meetings, samples of available business in prime and subcontract work are exhibited.

On hand to help businessmen are government technical advisers and loan administrators who can get money for equipment; also sponsoring Chamber of Commerce exhibits anxious to lend a helping hand, and industrial purchasing agents eager to line up additional suppliers.

Firms like General Electric, for example, think enough of the meetings to send their senior purchasing agent to most of the conferences.

In Cleveland last week, some 800 small businessmen showed up. Over 20 such meetings have been held in other cities since February, and more are scheduled.

Some experiences of exhibitors have been enlightening.

One major Maryland firm was more or less bulldozed into participating in an earlier conference. The firm claimed it had all the suppliers it needed. During the show, a representative of a small firm unknown to them offered a machine for a special job. They had sought something like it for several years and were elated to find it. They have since participated in a half dozen shows.

Another firm lined up 150 new potential sources of supply at a single show. Another has participated in three and will go through five more in hope of finding a single new supplier for a scarce item. At a meeting in Los Angeles, where textiles are about the fourth ranking industry, no local firms had bid on millions of new armed forces uniforms. Salesmen and government agency representatives went into all-night sessions.

Result: salesmen got thousands of dollars of orders and the government had new supply sources.

New Discoveries

Among the 200 companies were many who didn't know the other existed. Some wound up selling to each other.

General Electric at an Indianapolis show found a firm which had developed a special chuck to position successive pieces within 0.002 in. without repetitive gauging and inspection. G. E. now uses dozens of these.

G. E. is also scheduled to be one of the first firms in the U. S. to

use a new torque wrench uncovered at another show. This can be re-calibrated quickly if dropped or subjected to long use. It will save time in assembling items such as the J-47 jet engines in which almost all bolts are tightened to torque.

Union Carbide Nuclear Co., the subsidiary which operates Oak Ridge and other atomic plants, uses hundreds of specialty manufactured items and showed some in Cleveland. One 2-ft diam special bearing cost $400 each from a single source. An additional manufacturer was located and the price dropped to $176, plus added advantage of more than one source.

More Examples

Union Carbide business available to small producers ranged from small monel tapered ferrules selling at $14.75 per 1000 to an $1800, 30-in. hydraulic valve. About 24 million per year of the former are used. Union Carbide prefers to place orders in the under $50,000 category with smaller businesses because such orders are big business to a small company and get more attention and generally better delivery.

North American Aviation's Columbus, O. division felt the conference was worthwhile to acquaint suppliers with its specialized needs. The Columbus division, which builds jet fighters and trainers, spends about $55 million a year with small business firms, out of a total of $130 million. Nationally the company buys $274.8 million from small business firms out of a total of $624.7 million. Goodyear Aircraft division buys $25 million annually from 10,000 suppliers and is looking for more. General Motors has 25,000 direct suppliers, 88 pct of which employ under 500 people and 64 pct of which have less than 100.

Not Aware

The background of the conference series is that SBA believes small business firms (arbitrarily classified at under 500 employes) are not aware of how much government business is available. Neither do they realize that in many cases they are in better position to bid than their large competitors and that regional offices have all information on available business.



ARMY'S Chemical Corps displays at Baltimore SBA meeting typical items it purchases that could be easily supplied by small businesses.

Wendell B. Barnes, SBA administrator, says only about three fifths of potential defense contract dollars for small businesses went to them last year. Over a third of this was not even bid on by small businesses.

Total military prime contracts in the fiscal year to June 30 amounted to $17.75 billion. About $5.5 billion was in the area where small firms might successfully compete.

Less Red Tape

Mr. Barnes indicates a good deal of the red tape which has scared off small businessmen in the past has been eliminated. Forms have been simplified and arrangements for progress payments or other financial plans have been made available.

The Cleveland show was one of the better attended, with representatives from all over Ohio. Additional conferences will be held in St. Louis (Jan. 30-31) Chicago, Dallas, Ft. Worth, Amarillo, Houston, Phoenix and others, all through sponsorship of local chambers of commerce. Cities in which they have been held thus far include Boston, New York, Syracuse, Waterbury, Conn.; Trenton, N. J.; Philadelphia, Baltimore, Charlotte, N. C.; Atlanta, Richmond, Ind.; New Orleans, Kansas City and Parsons, Kans.; Tulsa, Little Rock, Denver, Seattle, Portland, Ore.; San Francisco and Los Angeles.

To Be Renewed

The program is in line with the general provisions of the Small Business Act of 1953, as well as what Mr. Barnes calls "the active program in government to help small firms, not only with their financial problems but also in getting an increased share of government contracts."

It is also helping the government get out of small business, source of 102 complaints last year of unfair government competition. And there is defense significance in keeping small business healthy since the Commerce Dept. estimates that it has one-third of the nation's industrial capacity.

The program is a safe bet to be renewed, since both political parties have endorsed its purposes.



BUSINESS OPPORTUNITY comes knocking at the door of small businesses. Conferences in major cities alert businessmen to opportunity of doing business with government. This meeting was held at Oakland, Calif.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, *Chestnut & 56th Sts., Philadelphia 39, Pa.*

LIQUID OXYGEN: Output Race Is On

Introduction by Linde of a lightweight cylinder this year was followed closely by a similar Cambridge model . . . Orders pile up for next year . . . Each sets goal of 3000 tanks in 1957—*By K. W. Bennett.*

◆ FAST GROWING industries occasionally suffer an old fashioned ailment—growing pains. This year the oxygen producing industry, which produces 2.25 billion cu ft per month, is feeling twinges.

The sharpest came when Linde Air Products Co. announced a liquid oxygen cylinder with 3000 cu ft capacity. The cylinder weighs only 505 lb when full. One man can move it. Linde hopes to produce 3000 of these tanks in 1957 and probably could sell more.

Each container consists of a stainless steel liner, vacuum packed in a medium carbon steel shell. Only 30 days later, Cambridge Corp. announced a similar tank. The Cambridge goal is an output of 200 to 300 units per month. The company expects a customer demand of 10,000 units per year. It can't make deliveries until April, and is already piling up orders.

Sales Race

Why all the excitement?

To the material supplier and component producer, it means a new market for stainless tanks, for carbon steel tanks and for valving, metering and piping equipment.

From the oxygen producer standpoint, these two small tanks exemplify the race to increase liquid oxygen output.

Liquid oxygen is gaseous oxygen compressed 860 times. A single liquid oxygen cylinder can store as much gas as 12 conventional high pressure gas cylinders. Empty, the conventional cylinders weigh three-fourths of a ton. The liquid tank weighs 260 lb.

Savings in shipping and storage space with a liquid gas storage tank can compensate for the higher cost of liquid oxygen.

More important, liquid oxygen can be shipped with freight savings that enable it to compete with gaseous oxygen suppliers already in the market area. Small liquid oxygen storage tanks are in the design or testing stage with major oxygen producers and several equipment suppliers.

Equipment Needed

For many years Linde has been the sole supplier of liquid oxygen. Liquid Carbonic Co., Air Reduction Co. and National Cylinder Gas are now in production. All three have equipment that could be used for liquid oxygen deliveries, but they'll need more. It will probably mean special tank trucks, rather than railroad cars.

Government fuel demands are taking up as much as 20 pct of available commercial liquid oxygen. This is delivered in tank cars. Deliveries to rocket testing sites can tie up the cars for weeks, on occasion, while local customers clamor for gas.

The small tanks and tank trucks are only a beginning. It's confirmed by tank manufacturers that oxygen consumers are planning liquid oxygen storage tanks for their own property. In other cases, an intermediate storage tank works out.

Change Distribution

In either case, it's a carbon steel shell over a stainless steel liner, with vacuum and insulating material separating the two tanks.

It spells a major shift in oxygen distributing methods. Installations of gaseous oxygen producing plants adjacent to major customers will continue to boom. The steel mill is the number one customer and the market area extends from Philadelphia through Chicago.

Linde will double its capacity in 1958, with the greatest portion of this productive capacity in gaseous plants. But only because the heavy producing plants are being built near large oxygen consumers, where gas can be piped directly to the user at low cost.

Tool Orders:

New Order Index reaches a peacetime high.

Orders for production tools, supplies and equipment reached a new peacetime high in October, the American Supply & Machinery Manufacturers' Assn. reports.

Distributors' orders placed with manufacturers were surpassed only by the Korean War period build-up. The association's New Order Index was 215.6 in October, up 7 pct from 200.7 in September. In October, 1955, the index was 13 pct lower.

This yardstick is based on incoming orders received by manufacturers from their industrial distributors. (July 1948 = 100).

Gains shown by the New Order Index follow closely the recovery in the Federal Reserve Index, which was 145 in October compared to 136 in mid-summer.

Order for Lockheed

Lockhed Aircraft Corp., Burbank, Calif., gets the largest jet training plane contract ever placed by the Navy—an order for $70 million worth of T2V1 Seastars.

The trainer can operate from both shore stations and aircraft carriers. It is to be brought into service in January.

YOUNGSTOWN: Mauthe Elected Chairman

Shift in top officers of Youngstown Sheet & Tube Co. brings A. S. Glossbrenner to presidency . . . Watson named vice chairman . . . Yeckley becomes vice president, operations; Mayer elected vice president.



J. L. MAUTHE
Chairman



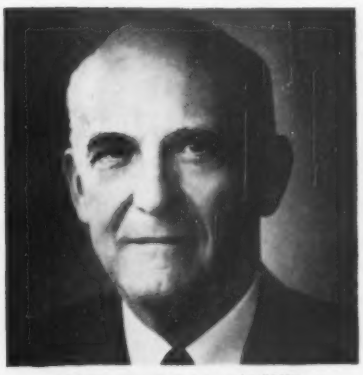
A. S. GLOSSBRENNER
President



WALTER E. WATSON
Vice Chairman



WILLIAM H. YECKLEY
Vice President



FREDERICK M. MAYER
Vice President

Story In Brief

After 6 years as president, J. L. Mauthe moves up to chairman of Youngstown Sheet & Tube Co. A. S. Glossbrenner becomes president; W. E. Watson, vice chairman; W. H. Yeckley, vice president, operations; F. M. Mayer, vice president.

◆ IN THE FIRST major top management shift in six years, J. L. Mauthe, president of Youngstown Sheet & Tube Co. since 1950, has been elected chairman of the board.

A. S. Glossbrenner, vice president-operations since 1950, succeeds Mr. Mauthe as president. Walter E. Watson, formerly first vice president, becomes vice chairman of the board.

William H. Yeckley, former manager of steel operations, was elected vice president-operations, and Frederick M. Mayer, president of Continental Supply Co., a division of Youngstown, was named vice president.

A native of Turkey City, Pa., Mr. Mauthe joined Sheet & Tube in 1935 as assistant general supt. of the Youngstown District. He became general superintendent in 1937; vice president-operations in 1943.

Mr. Glossbrenner came to Youngstown Sheet & Tube in 1935 as assistant superintendent of the hot strip mill at the Campbell plant. In 1943 he became general superintendent of the Youngstown district, and five years later was appointed assistant vice president in charge of all steel operations.

With Sheet & Tube since 1913, Mr. Watson has been first vice president since 1943. His first job was assistant general manager of sales. He became general manager of sales in 1917 and vice president in charge of sales in 1924.

After joining Sheet & Tube in 1937 as a test engineer, Mr. Yeckley advanced through various operational posts and became general manager of steel operations in 1953. Mr. Mayer has been president of Continental Supply since 1946.

SCREW MACHINE PRODUCTS: Sales Spiraling

Since World War II this industry has made steady gains . . . Shipments in 1956 totaled over half a billion dollars . . . But high costs spell trouble for some independents . . . Modernization programs in progress.

◆ SCREW MACHINE products shipments in the U. S. went up a whopping 81 pct in the years between 1947 and 1954—but observers believe that's only the beginning.

Preliminary results of the Census of Manufactures indicate output of these products was $424.7 million in 1954 compared to $226.5 million in 1947. Primary producers account for about 82 pct of the total.

For the long pull the industry is counting on sales of $700 million per year by 1965 in terms of 1953 dollars. And if inflation continues, they could hit $800 million.

For 1956, screw machine products shipments totaled about $522.4 million, slightly below 1955's $535.2 million.

Observers predict that in years to come producers will be fewer in number but larger in size. The current death rate among small companies is heavy. Screw machines are becoming more costly and need higher skilled operators. In addition, peace-time operation requires more output per dollar.

During World War II, the National Screw Machine Products Assn. notes, a man could set up in business for approximately $5000. Today it takes about $125,000 and the returns are slower and smaller. For example, a $1 million-a-year company nets only about $70,000 after taxes, and thus, profits would be eaten up by buying 5 new machines.

Electronic Inspection

Modernization of existing equipment is the important goal for the industry. The average age for screw machines by 1965 will be less than half of what it is today (two years ago, for example, 56 pct of all screw machines were 10 years old or older).

Electronic inspection will take over from the human element. This is particularly important because inspection has always been a costly area for a screw machine products firm where rejects have averaged 2 to 3 pct of total sales. And there will be more automation and better material handling.

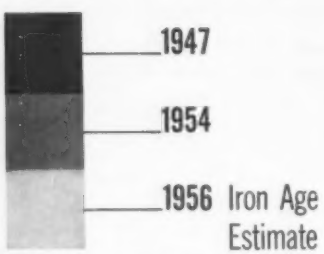
One of the major problems facing the independent producers of screw machine products is the role of the captive shop.

Independent's Outlook

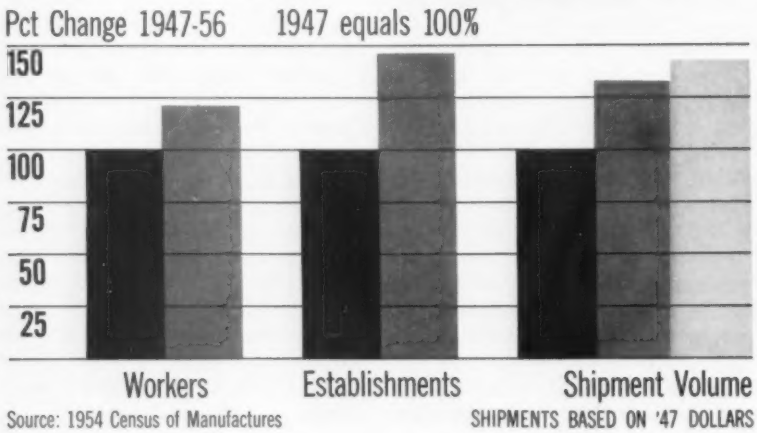
Independents will probably better than hold their own. First of all because supplementary unemployment benefits in the automotive industry will drive captive work into the open market. Secondly, because the big auto producers will almost certainly attempt to level out production schedules with a minimum of overtime, placing the balance of requirements in the open market.

Just how much of this excess production is turned over to the independents may mean the difference between life and death for some.

Business Takes a Turn for The Better





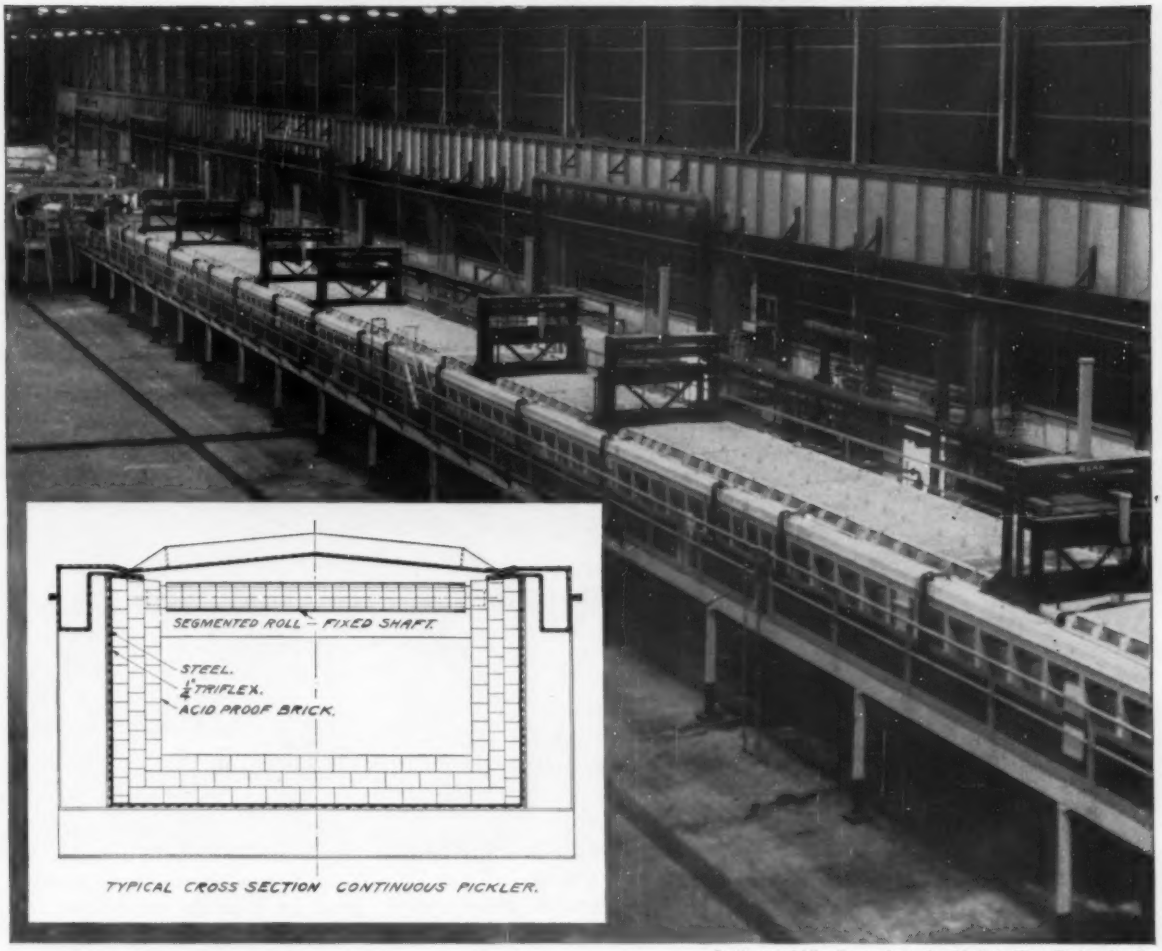


Source: 1954 Census of Manufactures

SHIPMENTS BASED ON '47 DOLLARS

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

B.F.Goodrich



Continuous pickling line engineered and built by Wean Engineering Co.

Continuous pickling line at work 4 years, looks good for years more

THE high speed, efficient pickling line at U. S. Steel's Fairless Works is now in its fourth year of continuous service with only a minimum of maintenance. The reason: B. F. Goodrich Triflex rubber lining. The result: big savings through lowered pickling and maintenance costs.

Twenty years ago such tanks were an innovation. Today, the steel, rubber and brick pickling tank is a standard specification. But the fact remains that just any tank of this type construction will not solve your pickling problems. It is B. F. Goodrich Triflex lining that ends leaks. This lining is not one layer of rubber, but three—hard rubber for acid resistance sandwiched between soft rubber for protection—with expansion joints which let the rubber expand and contract with the steel to which it is attached.

Remember, Triflex lining and expansion joints, the Vulcalock and Unilock processes for attaching rubber to steel, and brick sheathing are all B. F. Goodrich developments. Out of the hundreds installed during the past 25 years, not one has ever failed to end costly shutdowns for repairs and all other forms of pickling tank troubles.

Your specification of a B. F. Goodrich rubber-lined tank brings you, in addition to these proven construction features, the engineering experience of a group of men who are thoroughly grounded in modern pickling practice and capable of designing tanks to your individual needs. It is this record of past performance and experience which insures the economy and efficiency of every B. F. Goodrich installation. *B. F. Goodrich Industrial Products Co., Dept. M-780, Akron 18, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

EXPANSION IN INDUSTRY

CONSTRUCTION: New Records for 1957

Government projection shows 5 pct increase next year . . . No letup in plant expansion seen, but rate of gain will be slower than this year . . . Home building will continue its decline.

◆ NEW CONSTRUCTION in 1957 will total almost $46.5 billion, up 5 pct from this year's record volume.

This is the conclusion of estimates prepared jointly for 1957 by the Departments of Commerce and Labor.

The projection indicates that some expansion is likely in the coming year in most major types of construction, with the exception of new private housing.

Public Building Up

Because of that decline, private construction will increase only slightly over this year's level to $31.4 billion. But public construction outlays will climb about 12 pct to $15 billion.

The survey indicates that construction costs will continue to rise, but at a rate somewhat slower than in 1956. Building materials are expected to be in adequate supply. But mortgage funds will continue to be relatively scarce, contributing to the decline in new home building.

Here are some predictions:
(In millions of dollars)

	1956	1957
Industrial	3,060	3,200
Public Utility	5,080	5,750
Residential (non farm)	15,200	14,700
Highways	5,100	5,500
Educational	2,560	2,850
Office Buildings	1,365	1,500

Private industrial plant construction will continue to grow. But this rate is also expected to be slower than in the past two years. This is indicated by the declining level of new contract awards that has been noted in recent months, the fulfillment of capacity goals in some industries, and some downward revision in plans.

33 Pct Over 1955

Nevertheless, the $3.2 billion in new industrial construction that will be put in place in 1957 will be an all-time high. It will be 5 pct over 1956 volume and a full 33 pct over 1955.

Highway construction is expected to reach a new high of $5.5 billion. This is equal to an 8 pct increase over this year, due principally to the expanding federal aid highway program, the survey shows.

No. 4 for Kaiser?

Kaiser Steel Corp. is negotiating financing to build a fourth blast furnace at its Fontana, Calif., works.

This was disclosed by Edgar Kaiser, president of Kaiser Industries, at an East Coast press conference. He said if the financing is arranged, the fourth blast furnace will bring the Fontana mill's capacity to 3 million tons.

Granite City Plans

Granite City Steel Co. will construct a new sintering plant and two new batteries of soaking pits. The projects are parts of the company's program to increase ingot capacity to 1,584,000 tons in two years.

Construction of the sintering plant will begin next March and will be completed in about a year. Construction of the soaking pits will take nine months. The company expects that use of a sintering plant will enable it to increase production of its two blast furnaces by 10 pct.

B-W Spreads Out

Warner Automotive Parts Div. of Borg-Warner Corp. will construct a new, 162,000 sq ft plant at Auburn, Ind., to handle increased automotive parts demand.

The new structure will in part consolidate production operations that are currently occupying several old buildings. The plant will have extensive new equipment. Occupancy is expected by next fall.

The division produces automotive items such as differential cases, assemblies, internal gears, spiders, axle shafts, special gear box assemblies and similar products.

Dana Adds At Toledo

A new central office and warehouse facility will be constructed by the Dana Corp. at the Toledo, Ohio, location.

The building is planned to provide more space for an expanding engineering and research department and also to add more manufacturing space for the company's Toledo Div.



MULTIPRESS® precision-assembles hardware parts



8-ton Denison hydraulic Multipress equipped with indexing dial, used to stake shanks and inserts for door knobs.

Assembling hardware components at The Yale and Towne Manufacturing Company is handled with marked efficiency with Denison hydraulic Multipress.

For example, an 8-ton Multipress, equipped with an indexing dial, closes brass scalp on brass cylinder shell.Components are loaded manually at the front of the index table well away from the press ram. The table indexes automatically to position the work beneath the ram.

After closing, with a single swift press stroke, the assemblies index to an unloading station where they are ejected automatically by air to a conveyor belt.

Yale and Towne also uses Multipress to assemble glass door knobs. Breakage has been virtually eliminated because of accurately controlled pressure of the Multipress ram.

Check into the Denison hydraulic Multipress to improve your production methods — cut your costs. A Denison engineer will gladly show you how. Write to Denison Engineering Division, American Brake Shoe Co., 1242 Dublin Road, Columbus 16, Ohio.

HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS

DENISON HydrOILics

Bliss chooses TIMKEN® bearings for extra-big loads in world's largest knuckle-joint press

WHEN its customer needed a press to coin cups for artillery shell cases, Bliss created the largest knuckle-joint press ever built—a 4000-ton giant that not only costs less, but actually outproduces a greater-capacity press in this application.

Bliss engineers specified Timken® tapered roller bearings on press drive shaft and flywheel because Timken bearings have the capacity for unusually heavy loads, are built for long trouble-free life.

Full line contact between rollers and races gives Timken bearings their remarkable load-carrying capacity. Made of Timken fine alloy steel, they normally last the life of the machine.

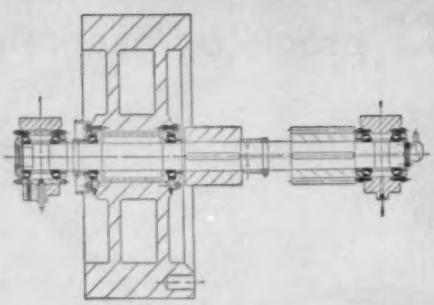
Tapered construction enables Timken bearings to carry any combination of radial and thrust loads. They hold shafts rigid—keep moving parts in proper alignment. Effective closures retain lubricant and keep out destructive dirt, so that maintenance is reduced to a minimum. Manufactured to extreme limits of precision and finished to incredible smoothness, Timken bearings practically eliminate friction.

In every machine you build or buy, get all the advantages only Timken bearings can give you—look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

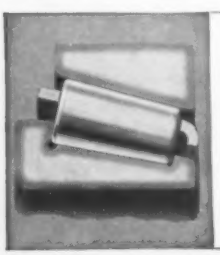


This symbol on a product means its bearings are the best.





HERE'S HOW E. W. BLISS COMPANY mounts the flywheel of their No. 33 press on Timken bearings, for extra load-carrying capacity and long, trouble-free bearing life.



GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. Timken fine alloy steels.



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▱ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION ✳

REPORT TO MANAGEMENT

Who's Fourth Quarter Pessimist?

It's traditional for economists and even business people who should know better to forecast dire things for the fourth quarter of every year.

You probably have observed this tendency in long range predictions for 1957. Don't make that mistake in drawing up your own outlook for the 1957 business picture.

It's only natural to hedge on predictions that far away. This may be one reason for traditionally less optimistic predictions for the last of every year.

But the record doesn't support gloomy fourth quarter predictions. Take this year, for example. Official figures from the Dept. of Commerce show this year's fourth quarter will be the best of the year.

Figures don't lie—this time. Fourth quarter statistics show continued rising income as the basis for "record volume of consumer spending." Business continues to invest in expansion and improvement, despite a tightening money market that was expected to halt some capital improvements.

Factory employment continues to grow. While employment was down in the summer months, start of 1957 auto production alone accounted for one-half of the 140,000 rise in employment in early fall.

Increase in durable goods business is indicated in that manufacturers backlogs at the end of September reached a total value of $62 billion, nearly $10 billion above the figure a year ago. These will continue to grow throughout the remaining months of 1956.

Are You Relaxed up in the Air?

Chances are you are, or you wouldn't be doing the traveling that's required of most businessmen today. But even so, the trend for companies to carry travel accident insurance is growing at a rapid rate.

A survey by the American Management Assn. shows that of a sample of 495 companies, 296 provide travel accident insurance. Of these, 270 covered all employees, only 26 covered executives only.

Rapid growth of travel insurance is indicated in that of the 296 companies carrying the insurance, 204 originated their plans in the past five years.

And it isn't just air travel either. Only 68 of the firms carry it for air travel only. All travel is covered in 103 companies.

It's believed the trend results from growing awareness of increased hazards of travel, coupled with the overall trend to increased fringe benefits.

Watch Your Language

The U. S. Court of Appeals has ruled that profanity of a worker is justifiable reason for firing, if it is a "disruptive" influence around a plant.

Decision results from a woman worker using "vile and obscene" statements to workers outside the plant. Among those laid off during a slack season, she was not rehired when others were taken back.

Says the court: "There are bounds of language beyond which an employee may not go and still retain his or her right to re-instatement. Perhaps such boundaries are far flung, but wherever the line is drawn it will not encompass as permissible the language used here."

This indicates the lady's language exceeded normal shop give-and-take.

INDUSTRIAL BRIEFS

Your "Steak" in Aluminum . . . The aluminum food container plant of Kaiser Aluminum & Chemical Corp.'s Foil Kraft Division at Wanatah, Ind., has commenced operations. Approximately $1 million was spent for construction of the new facility. The plant will supply containers to food processing industries and will augment production of the company's initial container plant in Los Angeles, acquired early this year from Foil Kraft, Inc.

New Specialty of the House . . . American Brake Shoe Co. is entering the specialty aluminum castings business. Limited production in a pilot foundry has been under way for about one year. The new aluminum foundry is under construction at Mahwah, N. J. These high integrity aluminum castings are the outcome of a research program initiated in 1954 and are now being used by aircraft manufacturers in structural parts and control assemblies.

Switching Tracks . . . Edgewater Steel Co. is moving its Chicago district office. The new office for the Pittsburgh, Pa., producer of wrought steel wheels and tires for the railroad industry will be in the Railway Exchange Bldg., 80 E. Jackson Blvd., Chicago 4, Ill.

Combined Operations . . . The combined office, warehouse and manufacturing facility of Metal & Thermit-United Chromium of Canada, Ltd., has been completed in Toronto. Production equipment is being installed and manufacturing operations will be in full swing by the end of December. Manufactured products will include: chromium, copper and nickel plating materials, liquid dips, organic protective coatings and Thermit welding compounds.

Place Your Bets . . . The Baltimore & Ohio R.R. is requesting bids on a proposed issue of $1.3 million principal amount of equipment trust certificates. It will finance not exceeding 80 pct of the net cost of 200 new 70-ton covered steel Hopper cars, subject to the approval of the Interstate Commerce Commission. Bids will be opened at the company's offices, No. 2 Wall St., New York, at noon on Dec. 10, 1956.

Breathe Deeply . . . A generator to produce oxygen by the liquefaction of air will be built at the Granite City Steel Co. next year. The generator will be able to produce 70 tons—48 million cubic ft—of oxygen a month. Air Products, Inc., Allentown, Pa., is the contractor.

Time Expired? . . . Rockwell Mfg. Co. will move its newly acquired Dual Parking Meter Div. staff to Pittsburgh and manufacturing operations to three Rockwell plants. Dual manufacturing operations will be divided among Rockwell's Tulsa, Okla., plant and its two recently completed Meter & Valve Div. plants.

Moving Out . . . To increase its manufacturing facilities, the Sterling Die Div. of Pratt & Whitney Co. has completed its move to a new plant location in the southwest industrial park section of Cleveland. The new facility will house the administrative offices and production facilities.

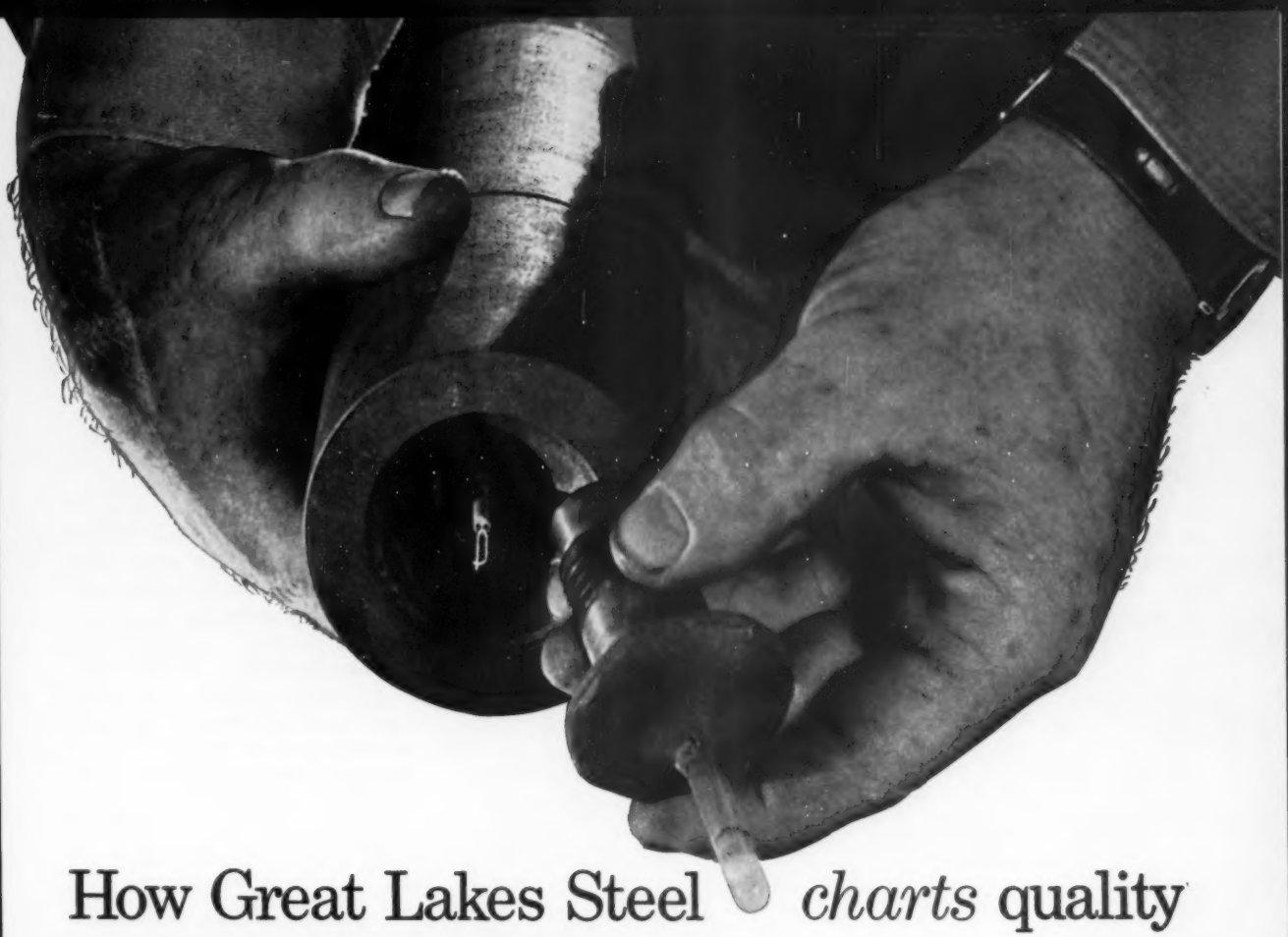
Try 316 . . . When the Riegel Paper Corp. completes its new paper mill at Acme, N. C., next year, it will place into operation a stock preparation system. The equipment will be entirely Type 316 stainless steel construction or stainless steel fitted. Black-Clawson Co.'s Shartle Div. is engineering and designing the system.

Chill Well . . . Borg-Warner Corp. has purchased certain patents from the Flakice Corp., New York. Borg-Warner's York Div. has been manufacturing ice makers for the production of cubes and other forms of shaped ice. Flakice Corp. retains other patents and all its trademarks. Each corporation will manufacture and sell its own lines of ice-making equipment independently of the other.

First in the Field . . . A number of vacuum casting furnaces, designed for use in the investment casting process, have been ordered by Austenal, Inc., for plant installation early in 1957. The erection of these furnaces will provide what may be the first production installation for vacuum investment casting. Pilot facilities have been in operation for the past two years.

For Outer Space . . . A satellite launching platform has been designed, built and installed by the Loewy-Hydropress Div. of Baldwin - Lima - Hamilton Corp, New York. The platform will be used for testing and firing the three-stage rocket which will attempt to place the satellite in its orbit around the earth. This is in support of U. S. participation in the International Geophysical Year, 1957-58.

Big Heat . . . A $600,000 foundry is being built in Landisville, Pa., for the Pennsylvania Malleable Iron Corp. of Lancaster, Pa. The plant will be equipped to produce malleable iron castings. It will consist of a foundry, cleaning and sorting rooms, annealing and shipping departments, with office and washroom facilities. About 125 men will be employed initially. The plant is scheduled to be in full operation by April 1, 1957.

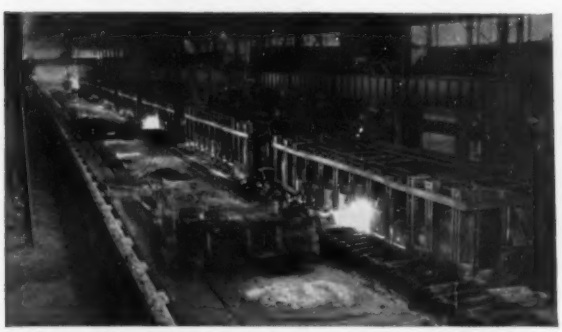


How Great Lakes Steel *charts* quality





Left: Thermocouple is inserted into an open-hearth furnace to check temperature of heat. Right: Multiple indicator records open-hearth temperature.



This view shows 12 of Great Lakes 17 open-hearth furnaces. Bright spots are furnaces being charged with pig iron and scrap. The open-hearth process takes from 10 to 12 hours.

This is the business end of a thermocouple, the rugged yet delicately accurate device that measures temperature in an open-hearth furnace. The two fine wires you see above, inside the casing, absorb heat and transmit it as an electrical current to be charted by recording potentiometers.

No chance for guesswork here—through eleven long hours the rising temperature of what will be 500 tons of Great Lakes open-hearth steel is meticulously controlled. Then, at exactly the right time and the right temperature, the glowing molten metal gushes into ladles for pouring into ingots.

The slender, spidery lines on the chart assure another heat of high and uniform quality steel. Quality that is checked and rechecked at every step to assure that customer specifications are met precisely.

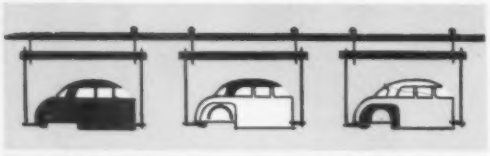
Why don't we get together and talk over your steel needs? Some time soon?

GREAT LAKES STEEL CORPORATION

Detroit 29, Michigan • A Unit of

NATIONAL STEEL CORPORATION

District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.



AUTOMOTIVE ASSEMBLY LINE

Automakers' Real War—Against Costs

Big problem isn't styling and engineering, but how to get high cost down . . . Rule is to cut costs where it won't show . . . Even pennies mount with big production schedules—By *T. L. Carry.*

◆ PRODUCT PLANNING is one of the most fascinating aspects of the automobile industry. People involved in this type of work are constantly concerned with the future. To them, new cars are old even before the public gets a chance to see them or buy them.

An auto company's product planning committee works in advance at least three to four years on new model automobiles.

It is a tremendous task. The job involves decisions about styling, engineering advances and tooling.

Cost All-Important . . . All the time that these decisions are being made the cost factor hangs heavily over the head of each committee member.

A company can have the sharpest looking and best performing car on the road, but if it costs too much to produce and market, it's still no good to the company.

As an example of how important cost is, let's suppose that a company with an expected volume of 1.5 million cars has to pay an additional 1¢ for the cost of only one part of the car. If the firm reaches its production goal, its cost has increased by $15,000.

Even in these days, that is still a lot of money. So it is not unusual for planning committees to argue for hours over mere pennies.

Still, more and more improvements have been introduced on automobiles every year. Although the price trend has been consistently upward, it has not been as much as it could be, mostly because of the advance work done by product planners.

Where To Cut . . . It is a well-known fact in the industry that just about every time the price of one particular item in a car increases, its cost is taken out somewhere else in the car.

A company's top management wants to have its cake and eat it too. They want improvements in cars but they want to hold the cost down.

This has been going on for years in the industry and the industry has developed a general rule of thumb: "Always take the cost out of the car where the customer can't see it."

A big producer in Detroit switched to a wraparound windshield a year or so ago. This increased the cost $6 over the previous type of windshield. The wraparound was considered a "must" so the only thing left to do was to cut the price somewhere else.

Here's how the company did it. It took a competitor's car which was already equipped with a wraparound windshield. Then engineers proceeded to tear the car down nut by nut and bolt by bolt. By the time the job was finished, the company knew just where the competitor had eliminated the $6 increase in cost.

In some cases, an automaker can squeeze pennies by not putting as many springs in seats as he ordinarily would. In other cases, perhaps only one piece of



WILLYS MOTORS' "Forward Control" Jeep FC-150 may be the forerunner of other new lines aimed at both on and off-highway use. Current highway construction boom is expected to create a big demand for the vehicles.

Prehistoric monster?

No. You're looking at the *world's largest dredger* . . . a hungry man-made monster of a machine that can move a mountain of earth in a day.

Imagine the brute power it takes to move this behemoth—even more, the joint-strength it needs to hang together despite the strains and stresses it undergoes! It typifies what's been happening in the earthmoving equipment field. They're making them bigger, more powerful, more rugged.

What helps hold such hard-working equipment together?

Plenty of standard *nuts and bolts.* They have to be strong and flawless, these fasteners . . . completely reliable.

RB&W—A MAJOR AND RELIABLE SUPPLIER

A leader for 111 years, RB&W turns out the finest quality fasteners possible—for the heavy equipment field as for so many other major fields in industry. *Modern facilities, new techniques, long experience* . . . all combine to make RB&W fasteners truly the "strong point of any assembly".

CONTACT THE RB&W "FASTENER MAN"

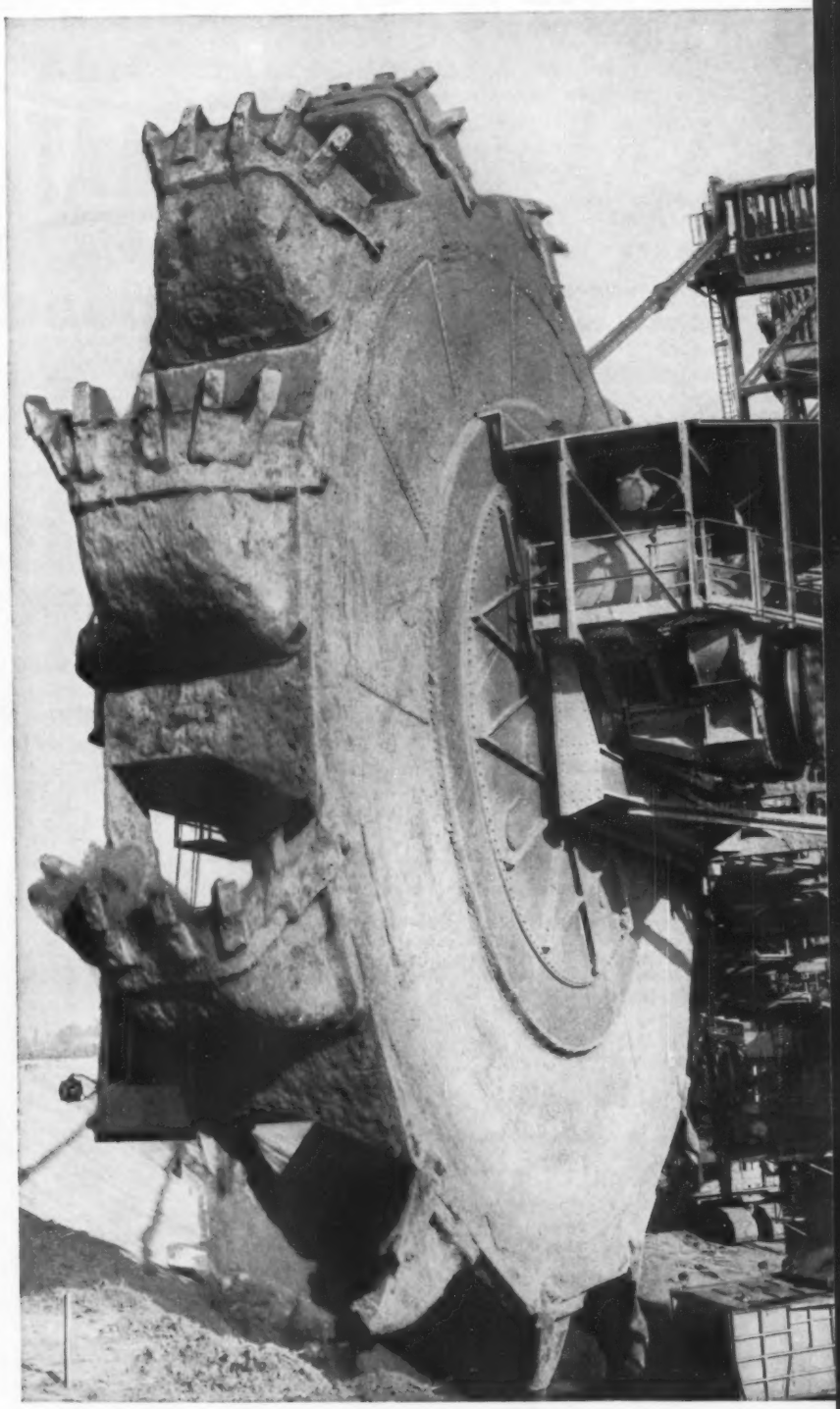
Proper application of standard fasteners can save you money. Ask the RB&W "Fastener Man" to show you how. Contact your nearest RB&W office.





RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Plants at: Port Chester, N. Y., Coraopolis, Pa.; Rock Falls, Ill., Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; **Distributors from coast to coast.**



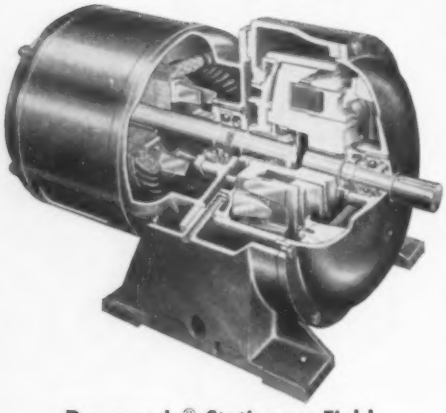
RB&W FASTENERS - *Strong Point of any assembly*

No Commutators, No Rings, No Brushes, No Rotating Coils—in the NEW

EATON

DYNAMATIC®

Adjustable Speed Drives



Dynaspede® Stationary Field Coupling, with Integral Motor

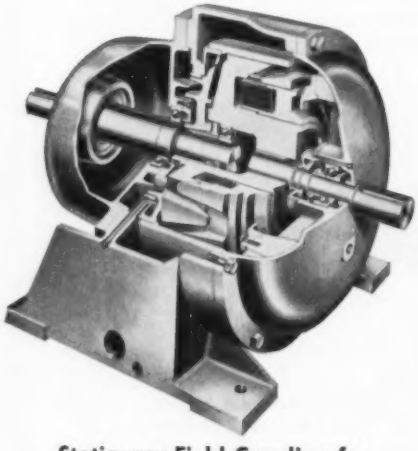
Dynamatic stationary field couplings are the simplest drives so far devised to provide infinitely adjustable speed from an alternating current source. The absence of rotating coils, brushes, slip rings, and commutators in this design holds wear and maintenance to an absolute minimum. Dynamatic electronic or magnetic amplifier controls, in combination with these drives, provide wide latitude in operating functions.

Check these Outstanding Advantages:

Accurate speed control • Wide speed range • Low power losses • Simple construction • Rapid response • Remote control • Quiet, efficient operation • Low maintenance costs

Ajusto-Spede® Drives: Air cooled, stationary field eddy-current couplings mounted integrally with D-flange open drip proof squirrel cage motors are available in capacities from 1 to 75 HP. Units of the same design and capacities are also available without motors.

Dynaspede® Drives: Liquid cooled, stationary field couplings mounted integrally with D-flange squirrel cage motors are available in capacities from 3 to 75 HP. Motor types available are drip proof, splash proof, totally enclosed fan cooled, and explosion proof. The coupling is totally enclosed. Separately mounted couplings are also available in capacities from 3 to 2500 HP and larger.



Stationary Field Coupling for use with Separately Mounted Motor

Send for Detailed Information on these New Stationary Field Couplings and Drives

EATON — DYNAMATIC DIVISION — MANUFACTURING COMPANY

3307 FOURTEENTH AVENUE • KENOSHA, WISCONSIN

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
DEC. 1, 1956	165,641	26,053
NOV. 24, 1956	127,524	19,467
DEC. 3, 1955	184,336	29,170
NOV. 26, 1955	138,126	22,963
TO DATE 1956	5,554,910	1,113,120
TO DATE 1955	7,692,900	1,231,100

*Estimated. Source: *Ward's Reports*

glass will be used where there were previously two pieces.

But in any event, as auto executives like to say, the value of automobiles continues to go up every year because of the innovations and improvements that are introduced. And they are generally better than the small changes that are made to save money.

Willys Gets the Jump

Willys Motors, Inc., is introducing a new four-wheel drive truck which it calls the FC-150.

The new unit is designed to provide a maximum of cargo space in relation to its wheelbase.

The forward control design of the vehicle's cab allows more space for payloads and at the same time places the driver upfront, giving him better visibility.

Powered by an F-head, four-cylinder engine, the FC-150 has four-wheel drive for off-the-road operations and shifts to two-wheel drive for conventional operation.

The up-front position of the cab provides a payload bed of over six ft despite the vehicle's 81 in. wheelbase. With the tailgate extended, the cargo carrying space is 92 in.

It is interesting to note that this vehicle is designed specifically for customers who do a great deal of off-the-road work.

The trend for truck and utility vehicle manufacturers to produce this type of unit will increase greatly in the next few years.

Biggest shot in the arm to these companies will be the greatly expanded road building program in this country.

It is in this field that the biggest need will be felt for a vehicle that can perform satisfactorily both on and off the road.

It's possible that this new jeep is just one of several models which various companies will be making within a short time.

Autoworkers:

UAW gets ready for short work week drive.

The United Automobile Workers' regular 2-year convention won't be held until next spring. But already sparks are starting to fly in Detroit in anticipation of the big event.

It is generally conceded that any floor fights that develop during the parley are likely to come up over the matter of a dues increase.

The union's executive board is somewhat touchy over the subject at this stage and has been busily denying reports that it would recommend an increase of $1.50 a month when the convention meets.

Reuther on Top

Actually, there won't be too much more to haggle about at the convention. Walter Reuther's position as president of the UAW has grown increasingly stronger since the 1955 convention.

He added measurably to his stature when he obtained 3-year contracts from each of the Big Three automakers and also established the principle of the guaranteed annual wage in gaining the supplemental unemployment benefits.

Propaganda Starts

While the delegates are fighting over dues, watch for the start of a huge propaganda barrage for a shorter work week. It is at the upcoming convention that the groundwork for adoption of a shorter week will be laid.

Contracts with the Big Three don't come up for renewal until 1958. But remember the campaign that preceded adoption of SUB. It was long, and ultimately successful.

Some speculation has already started in Detroit regarding the shorter week. Best guess right now is a 7-hour, 5-day week. Automation will be the real whipping boy in this campaign.

THE BULL OF THE WOODS — **By J. R. Williams**



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You can combine consistent high accuracy with real savings in time and money using these three Brown & Sharpe aids to precision. Their advanced design makes measurements easier, more positive. Their superior quality assures long operational life . . . keeps maintenance costs low. Only a few of their outstanding features are described here. For complete details of these and other precision tools in the complete Brown & Sharpe line, write to Brown & Sharpe Mfg. Co., Providence, R. I.

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THIS WEEK IN WASHINGTON

Can Labor Erase Right-To-Work Laws?

Unions go all-out to defeat right-to-work laws and those in Congress who support them . . . Results are about 50-50 in last election . . . Labor looks ahead to '58—*By G. H. Baker.*

◆ LABOR UNION officials are channeling more pressure — and more dollars—into their drive to erase all state "right-to-work" laws from the statute books.

Success in knocking off these "right-to-work" laws has been spotty, so far. In the November elections, voters in the State of Washington voted 2-1 against a proposed "right-to-work" law, whereas in Nevada a referendum to repeal a "right-to-work" law already on the books went down to defeat.

The voting for individual candidates who took firm positions on "right-to-work" laws follows approximately the same pattern. About as many candidates who supported "right-to-work laws won contests as did opponents. It's doubtful if voters in some contests really got excited about "right-to-work" laws (should union membership be compulsory?) which has caused so much concern in labor's inner circles.

Looking Ahead . . . Already looking ahead to the 1958 elections, the AFL-CIO recently published a list of U. S. senators it hopes to defeat. All lean to "right-to-work" laws. But it cannot be said with accuracy that "right-to-work" laws are on the way out. At least 10 state legislatures will talk about them in 1957, and some states may write them into law. The issue will be a hot one for at least the next several years. And it's far too early to tell whether "right-to-work" laws are spreading or dying out.

Among the senators the AFL-CIO wants defeated in 1958: McCarthy of Wisconsin, Jenner of Indiana, Bricker of Ohio, Byrd of Virginia, Goldwater of Arizona, Martin of California, Watkins of Utah, Williams of Delaware, Knowland of California, Purtell of Connecticut, Beall of Maryland, Stennis of Mississippi, and Holland of Florida.

Alert Civil Defense

Concern over the rash of shooting around the world has prompted Washington to put all regional offices of the Federal Civil Defense Administration on a round-the-clock basis. Up to now, only the main office of FCDA has operated on a 24-hr basis.

FCDA's function in time of emergency is to mesh its efforts with those of local relief agencies.

Excise Cuts Asked

Federal excise taxes on new cars and trucks are too high and should be reduced, motor vehicle builders told a congressional group studying tax matters.

These levies, amounting to 10 pct of the factory sale price, ought to be cut to 3½ pct on passenger cars and 5 pct on trucks and buses, says Robert E. Bryar, speaking for the Automobile Manufacturers Assn. Mr. Bryar, director of tax affairs for the Studebaker-Packard Corp., also asks that the present 8 pct tax on automotive replacement parts be lowered to 2½ pct.

Consumers are bearing a heavy financial load because of the "discriminatory" level of the auto taxes, according to the industry.

U. S. Breaks Moscow Fair Date

▪ Russia's recent conduct in Hungary and elsewhere has caused the U. S. to cancel plans to participate in a trade fair at Moscow next summer.

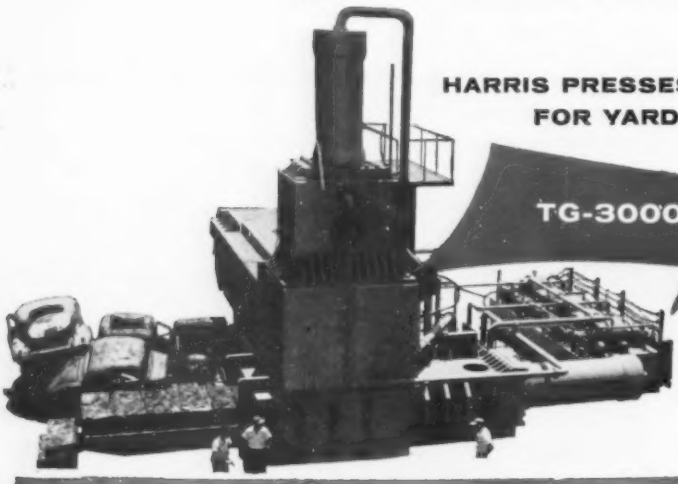
▪ Before the Reds' recent display of ruthless force, the government was favorably disposed to send exhibits and to clear the way for U. S. firms to take part. American officials went to Moscow to make arrangements.

▪ Officially, the U. S. government has made no announcement of its change in plans. It simply dropped the Moscow fair quietly off the list of fairs at which the U. S is scheduled to participate.

▪ The U. S. will, however, probably take part in an international fair at Posnam, Poland, as an indirect show of support of Poland's move to gain freedom. It would be the first trade fair behind the Iron Curtain in which the U. S. participated.

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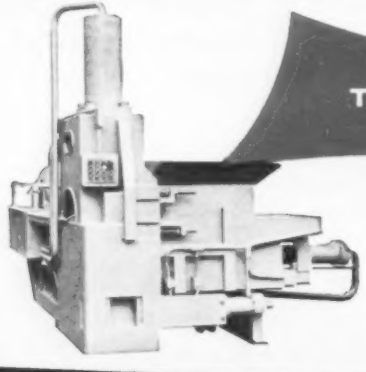
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Northwest Power Boom Aids Metalworking

More capacity will benefit metal firms two ways . . . Fabricators want the added output, construction of plants means more sales for equipment suppliers . . . Meeting power needs to '65 is aim—By R. R. Kay.

◆ TALK of more power production in the Pacific Northwest is welcome news to metalworking firms in the area.

There are two important reasons why: (1) Power looms large in their future plans, especially for the aluminum fabricators. (2) There's a lot of metalworking to be done on the huge hydro-electric projects.

Down the Decade . . . The Bonneville Power Administration is optimistic. In a 10-year forecast, the agency says a big stepup in non-federal power generation will allow the area to meet its needs through 1965. Only hedge: Stream flow will have to be about average.

BPA points to these major non-federal projects, either on the Columbia River or on its tributaries: Rocky Reach, Priest Rapids, Wanapum, Noxon Rapids, and the Hells Canyon trio: Brownlee, Oxbow, and Hells Canyon. Another 43 projects are unscheduled as yet. Although Idaho Power Company continues to work on Brownlee, first of the three proposed Hells Canyon dams, court action is still pending on the company's Federal Power Commission license.

Uncle Sam's Activities . . . Federal projects currently underway —all on the Columbia River—include McNary, Chief Joseph, Roza, Cougar, Hills Creek, Ice Harbor, and the Dalles, site of the $65 million Harvey Aluminum 54,000-ton reduction plant. Eighteen more projects are either under construction or licensed to public utility districts and private utility firms.

There will be increasing need for steam generation, BPA predicts. And as for nuclear power, it says, "Nuclear plants of a size and cost to compete with the hydroelectric plants under active consideration must probably await another decade or more of engineering development."

During 1956, power use in the Pacific Northwest ran a little ahead of expectations, a reflection of generally excellent business conditions. However, the region is no longer outstripping the nation in rate of load growth.

Northern Treasure

Alaska is a mineral treasure trove. Verification of boosters' sometimes extravagant claims has come from the United States Bureau of Mines. The agency says gold paced the territory's $25 million mineral production last year.

The Yukon River region led all sections of the territory, with a total of more than $12 million in mineral production, more than half of it from gold.

Fabrication Factor

Convair's B-58, the nation's first supersonic bomber, is expected to fly faster and higher than any other U. S. bomber. Structurally, it incorporates the most practical advanced design the Air Force knows. It is the first production aircraft to use brazed stainless steel sandwich panel as primary structure. So says Lt. Gen. C. S. Irvine, deputy chief of staff, materiel, U. S. Air Force.

Moving Into High

Expansion of Los Angeles County's industrial plant is rocketing along at a record rate. Before year-end, new plants and expansions will hit $340 million—largest ever.



Wondering Where the Tin Cans Went?

◆ THESE and 8 million others are being put to use at North American Aviation in connection with the firm's new $5 million trisonic wind tunnel. They're fed into the hopper and up the chute to one of eight air-storage spheres for the tunnel. Duty of the 1½ million lb of cans is acting as a radiator. They keep temperatures of air for the tunnel nearly constant during a test blow. Tunnel will be completed in March.



Seven Products Replace Twelve. Sun representatives show how Sun's plan of industrial lubrication and preventive maintenance benefit management.



Over 70% of all plant equipment is now lubricated by only two moderately priced oils.

How A Sun Engineer Helped Cut Lubrication Costs by 15%... Reduce Oil Inventory by 42%



Maintenance Is Easier. Sun's plan helps prevent mistakes...reduces chances of applying wrong lubricant.

For years, department foremen of a large folding box plant purchased "special" lubricants to meet individual needs. Throughout the plant, a total of twelve products were being used...some extremely high in price.

The man from Sun called management's attention to this fact. He pointed out that much of the plant equipment, although different in name and function, was mechanically the same. He proved that over 70% of the equipment could be lubricated by two products instead of several lubricants basically alike.

Today, as a result of Sun's recommendations, "special" lubricants are gone; costs of lubrication are down 15%; and, oil inventories are reduced by 42%.

For the full story about how Sun can simplify lubrication setups and save on oil costs...see your Sun representative or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. IA-12.

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One Way To Machine Shop Versatility

West Coast plant uses tracer-controlled machine tools to build new business . . . Advantages cited by company president . . . New uses keep units busy . . . Record for gears—By E. J. Egan, Jr.

◆ "THE TRACER-CONTROLLED machine tool is the greatest single asset the operator of the average jobbing machine shop can have. It enables him with minimum outlay to get into a class of work which formerly required machine tool investments of hundreds of thousands of dollars."

So says James Dillon, president and general manager of Darco Industries, Inc., El Segundo, Calif. He speaks from experience in the aircraft and guided missile fields when he says that "today's job shop operator has to be versatile in order to survive."

Five at Once . . . Dillon's firm appears to have learned this lesson well. It went in for tracer-controlled machining several years ago after realizing that it was constantly turning down good jobs because its equipment couldn't do all of the operations required. In other cases, the firm's bids were too high, due to the cost of machining by what Dillon calls "the hard way."

Darco now does a lot of its work on 8, 10, 12 and 16-ft openside planers converted for 3-dimensional tracer control. As many as five different small jobs are often set up one machine at the same time. The operator simply moves from one job to another, and usually has only to change the cutter and stylus for each job.

New Applications . . . To minimize idle machine time, each job is carefully preplanned before any cutting is done. Operation sheets spell out every move in detail, and sketches are attached where needed for clear understanding.

Dillon says the major problem now is that the tracer machines are almost always overloaded; the firm keeps finding applications for them that were never anticipated originally.

Expanding Operations . . . In addition to the four tracer-planers, Darco now has three other tracer-controlled machines: two engine lathes and a rise-and-fall horizontal mill. At present, 90 pct of the firm's work goes to a tracer-controlled unit for at least one operation. According to Dillon, an across-the-board average shows that these equipment items are cutting costs by 300 pct.

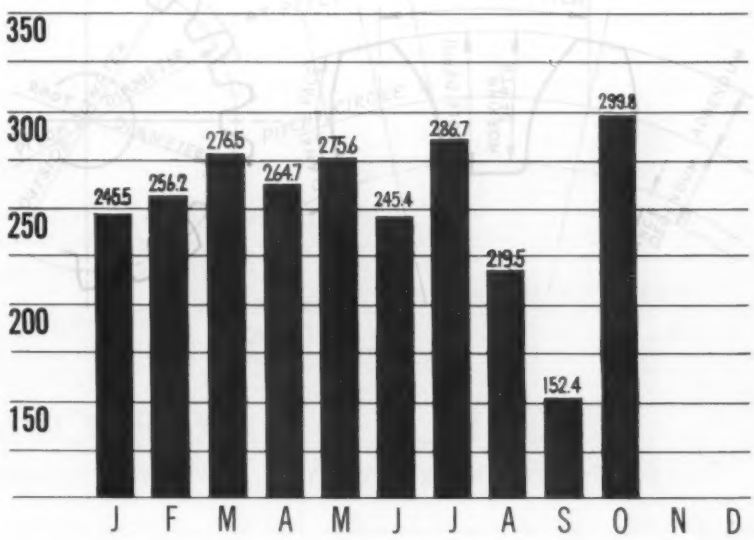
Direct Benefits . . . Darco attributes these direct benefits to its tracer-controlled machines: (1) well-balanced machine loads, (2) less tooling required, (3) better quality work, (4) increased production, (5) lower costs, (6) more stable backlog.

Record for Gears . . . Index of business volume in the gearing industry hit an all-time peak of 299.8 in October. This erases the previous record set only last July, when the index hit 286.7. October's business volume was a full 30 pct more than was recorded in September, and 32 pct higher than it was in October, 1955.

Source: American Gear Manufacturers Assn.

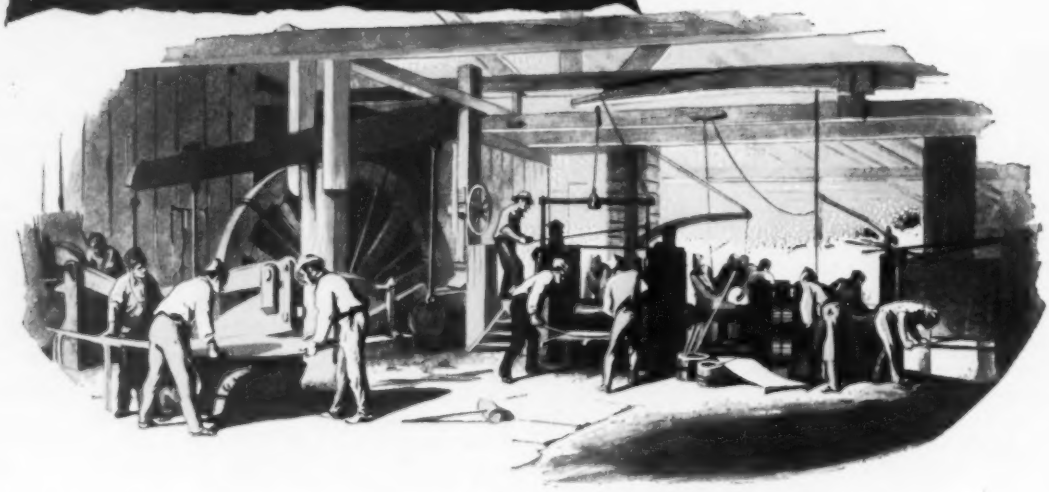
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Thirteen years after the War of 1812, Lukens Steel Company in Coatesville, Pennsylvania, was producing America's first rolled iron plates for boilers. Using tools and equipment that would seem exceedingly crude today, they rolled charcoal blooms into plates.

In 1825 the production of plates was limited to less than 34 inches width in this water-driven mill. Today, Lukens Steel Company has the country's largest plate mill, producing rolled plates up to 195 inches in width.

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The Iron Age SALUTES

Joseph M. Tull Chairman of the board, J. M. Tull Metal & Supply Co., his faith in the South's future was well founded. For his part in building the region's industrial capacity, he was cited by fellow warehousemen.

Joseph M. Tull's lifelong faith in the industrial future of the South is paying off. Since 1914 he has been combining southern geniality with sound business judgment, and has reaped a bumper crop of customers and friends.

Many a Dixie metalworking company that was struggling to survive during the depression of the 1930's owes its existence to Joe Tull's generosity—and to his level-headed business philosophy. A company that goes out of business, he figured, is lost as a customer. Willingly, he extended unusual credit in justified hardship cases.

And when other warehouses were sending potential customers out of the region for seldom-used items, Joe Tull got those items in; made them a regular part of his stock.

Many times he added products to his general warehouse line for which there had been no prior business in the southeast. For example: nickel alloys, steel tubing, and special gears. Joe Tull's readily available supply gave local companies the incentive to use these items. For his long record of service to industry, he was cited by the American Steel Warehouse Assn.

Born in Philadelphia and transplanted at an early age to Morganton, N. C., Mr. Tull later moved to Atlanta, Ga., where he founded his first stock center. Total employment—3. Today, his five warehouses employ 350.

At 78, as board chairman, he is still eager to plot the course of the South's industrial future.

His answer to the rust of retirement is a plan for expanding his company's warehouses into a chain of service centers that will link the growing industrial hubs of 10 states. It's a safe bet that his plan will succeed.

You could almost call Joe Tull an industrial pioneer. By helping develop industry in the South, he has added strength to the nation's economy.

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The Iron Age INTRODUCES

Robert B. Manning, elected president, **Sperry Western, Inc.,** Lafayette, Iowa.

J. L. Tunstead, appointed vice president, **Koppers Co., Inc.,** Pittsburgh. Also, he has been appointed director, sales, and asst. manager, Koppers Marketing Dept.

Robert B. Kramer, appointed plant manager, Page Steel and Wire Div., **American Chain & Cable Co., Inc.,** Monessen, Pa.

Thomas W. Johnson, elected vice president, **The New York Air Brake Co.**

G. L. Pitzer, appointed vice president, production, **Bakelite Co.,** Div. of Union Carbide and Carbon Corp.

S. S. Inch, named vice president and director, sales, **Kaiser Aluminum & Chemical Corp.,** Oakland, Calif.; **John E. Menz,** named vice president and general sales manager, sales company, Chicago.

Henry M. Haase, elected vice president, engineering and research, **Borg-Warner Corp.,** Chicago.

Harold H. Blackmur, named superintendent, Bolt and Nut Dept., Los Angeles plant, **Bethlehem Pacific Coast Steel Corp.**

Roy P. Trowbridge, named director, engineering standards section, **General Motors,** Detroit.

William J. Ryan, appointed shop superintendent, **The Cleveland Crane & Engineering Co.,** Wickliffe, Ohio.

Following men have been named superintendents, Truscon Steel Div., **Republic Steel Corp.,** Youngstown: **Myron E. Ferguson,** window; **Jesse B. Hall,** shipping; and **Ralph F. Thomas,** production.

Herbert J. Arnold, named supervisor, stainless flat rolled product sales, **Crucible Steel Co. of America,** Pittsburgh; **Frederick H. Thoke,** named supervisor, stainless bar wire and billet product sales.

R. L. Jolly, appointed general manager, Martins Ferry, Ohio, Factory, **Wheeling Steel Corp.,** Wheeling, W. Va.; **R. W. Oldham,** appointed general manager, Steelcrete Factory, Beech Bottom, W. Va. and Wheeling Factory, Wheeling, W. Va.

Frank E. Juranek, named general traffic manager, **Clark Equipment Co.,** Buchanan, Mich.

Norman R. Klivans, appointed asst. general sales manager, **Brush Electronics Co.,** Div. of Clevite Corp., Cleveland.

William Alvarez, named manager, engineering, Industry Control Dept., **General Electric Co., Roanoke, Va.**



R. K. TURNER, elected vice president, Carbide and Carbon Chemicals Co.



WILDER BEAL, elected vice president, Union Carbide Ore Co.



ARTHUR V. LOUGHREN, elected vice president, Research Div., Airborne Instruments Laboratory, Mineola, N. Y.



B. E. McARTHUR, elected vice president, engineering, Magnethermic Corp., Youngstown, O.





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Thomas J. Carbine, appointed Philadelphia district sales manager, **Laclede-Christy Co.,** Div., H. K. Porter Co., Inc., St. Louis, Mo.

John R. Gorey, named sales promotion manager, **Lindberg Engineering Co.,** Chicago.

Don L. Geisert, named western sales manager, monumental and commercial construction markets, Industrial Parts Div., **Reynolds Metals Co.,** Louisville, Ky.

John Rudy, appointed office and credit manager, Pittsburgh steel service plant, **Joseph T. Ryerson & Son, Inc.,** Chicago.

George J. Shailor, named manager, sheet and strip, New York warehouse, **Jones & Laughlin Steel Corp.,** Pittsburgh.

Robert W. Pearson, named deputy general manager, operations, Electronics Div., **American Machine & Foundry Co.,** Boston.

Richard G. Priest, named field manager, Cleveland, **Leece-Neville Co.,** Cleveland.

Richard Powell, named general manager, Clyde (Ohio) Div., **Whirlpool-Seeger Corp.,** St. Joseph, Mich.

Anthony Maladra, appointed sales manager, Stud Welding Div., **KSM Products, Inc.,** Merchantville, N. J.

J. Fred Belles, named coordinator, payroll procedures and statistics, **Jones & Laughlin Steel Corp.**

Lou D. Grove, appointed sales and engineering representative, New York state, Cone-Drive Gears Div., **Michigan Tool Co.,** Detroit.

Kenneth C. Bradley, appointed lathe sales engineer, Machine Tool Dept., **Axelson Div.,** U. S. Industries, Inc., Vernon, Calif.

W. A. Patterson, named chief engineer, **Steel Processing Co.,** subsidiary of Fort Pitt Bridge Works, Pittsburgh.



JOHN R. DINGLE, elected vice president, manufacturing, The Cleveland Worm & Gear Co. and The Farval Corp., Cleveland.



SIDNEY L. EASTMAN, elected vice president, engineering, The Cleveland Worm & Gear Co., Cleveland.



LEE O. WITZENBURG, elected vice president, sales, The Cleveland Worm & Gear Co. and The Farval Corp., Cleveland.



O. G. SPECHT, JR., named Detroit district manager, Electro Metallurgical Co.

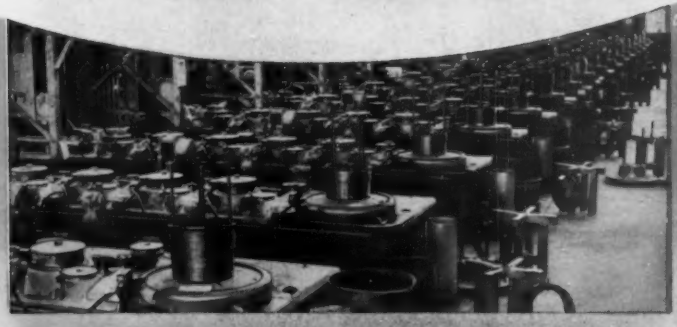


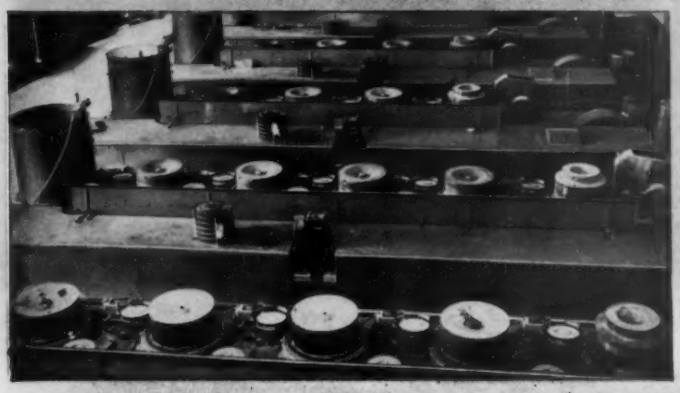
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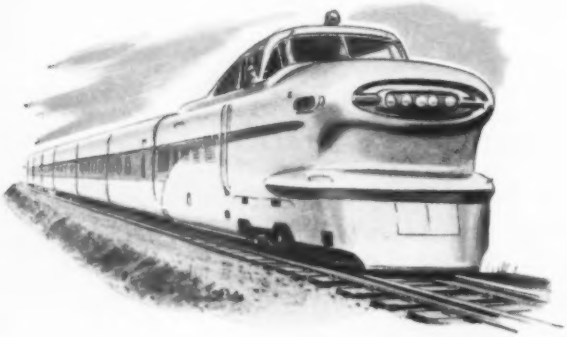
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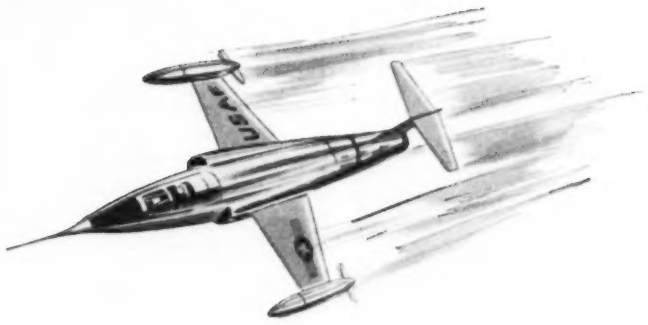
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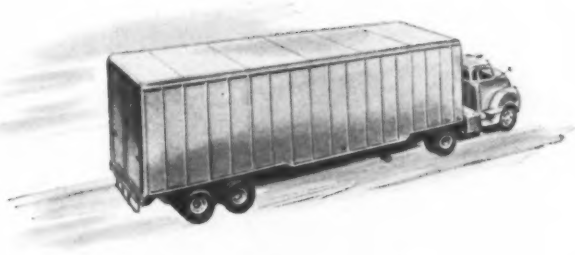


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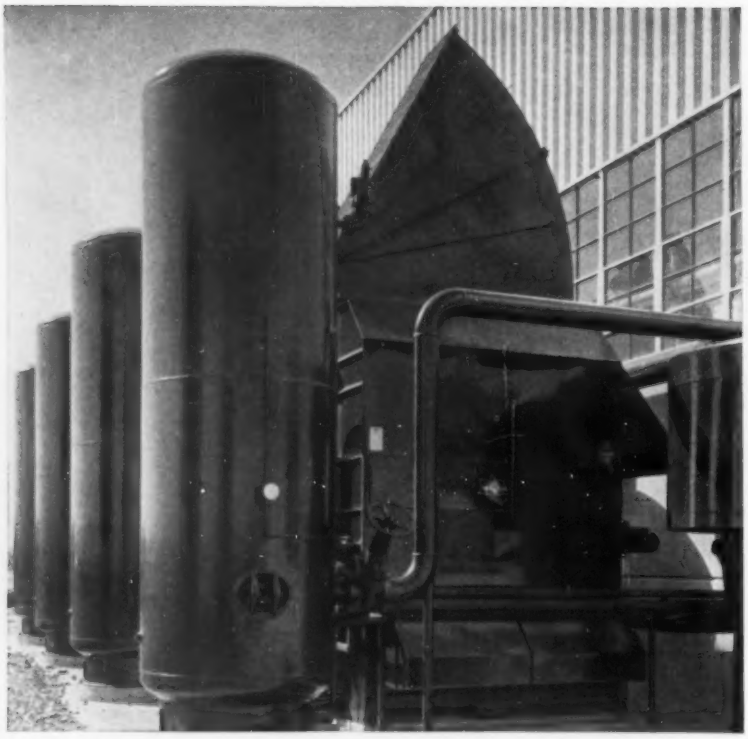
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Richard T. Thornton, named manufacturing manager, General Products Div., **Ford Motor Co.,** Dearborn, Mich.

William Pettigrew, named field engineer, Detroit area, **Norton Co.,** Worcester, Mass.; **Russell J. O'Neil** and **Lincoln M. Johnson,** appointed abrasive engineers, metropolitan Detroit.

Joseph S. Pares, appointed field engineer, Aeronautical Div., **Robertshaw-Fulton Controls Co.,** Anaheim, Calif.

Karl C. Schmedicke, named manager, manufacturing, **Lamson Mobilift Corp.,** Portland, Ore.

Dean Shepherd, appointed purchasing agent, **Allis-Chalmers Terre Haute (Ind.) Works.**

Harold W. Dawson, named division industrial engineer, Truscon Steel Div., **Republic Steel Corp.,** Youngstown, O.

Regis O. Bridge, appointed director, purchases, **Crucible Steel Co. of America,** Pittsburgh.

Justin E. Foldessy, appointed asst. chief engineer, special construction, Gary Steel Works, **U. S. Steel Corp.**

Arthur J. Reed, named general purchasing agent, **The McKay Machine Co.,** Youngstown, O.

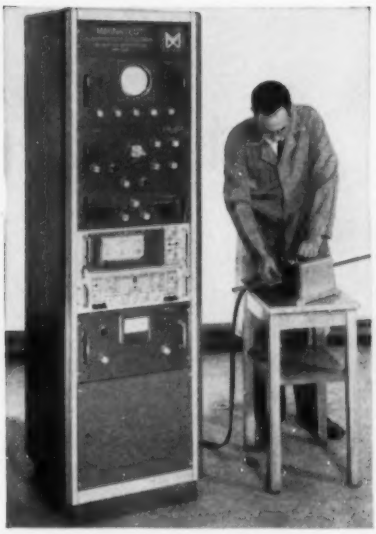
OBITUARIES

Louis H. Derrer, 62, vice president and general manager, steel works, **Algoma Steel Corp., Ltd.,** Sault Ste Marie, Ontario, Canada.

Moro M. Borden, 79, engineering consultant, **Simplex Valve and Meter Co.,** Lancaster, Pa.

Gordon E. Tomb, 45, sales manager, San-Equip Div., **Vega Industries, Inc.,** Syracuse, N. Y.

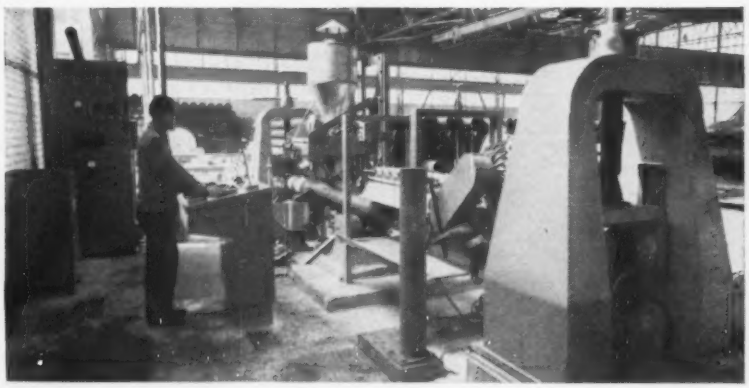
Case Studies:
NONDESTRUCTIVE TESTING SYSTEMS



The MAGNATEST FW-400 Series is electronic, eddy current equipment for nondestructive testing of non-magnetic rod, wire, or tube from 1/64" to 3" diameter. The test is fully automatic and can run at high mill rates (up to 400 and 500 f.p.m.). With the FW-400 such problems as seams, cracks, concentrated porosity, inclusions, stringers, laps, and splits may be detected at the level required. Diameter variation, embrittled areas, and scale are other conditions found with the unit.



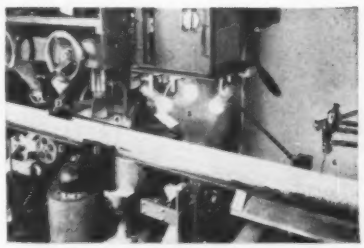
SEMI-AUTOMATIC MAQ 1694 MAGNAFLUX. Unit speeds end inspection for rod mills. A special conveyor extension carries short coil-end samples through a Magnaglo bath. They are then magnatized automatically and pass on to the curtained "black light" booth where defects, if any, show up as glowing indications on the rod ends. The Rate: 15 per minute. This system has cut inspection time in half and has eliminated the need for most acid etching equipment at several mills.



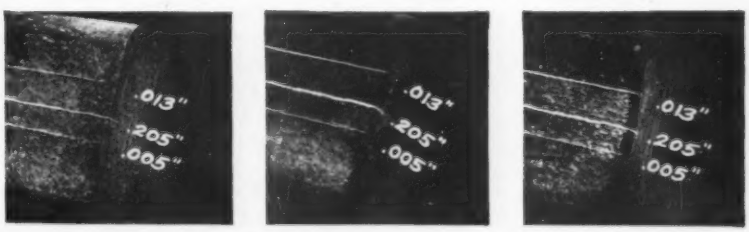
This picture shows the first new fully automatic Magnaflux PYQ equipment used in a steel mill on pipe weld testing. The man operates the mill itself, the Magnaflux unit uses photoelectric inspection.

New Methods Developed for Mill Tonnage Testing

Nondestructive testing has grown from a "sometimes" thing to a full time production tool in many mill operations. New techniques and methods have been developed for every type inspection. Whether the mill produces rods, tubes, rounds, squares, bars or billets, M offers semi or fully automatic inspection systems for practically every need. For instance, the type of defect most commonly found in resistance welded steel line pipe is longitudinal cracks in the weld. As shown in the illustrations above and at the right, such cracks can now be detected automatically right after welding. The crack is spray-marked on the pipe. This is done at production line speeds and without operator optical fatigue factors.



This unit tests pipe welds at rates over 100 ft. per minute. Magnaflux indications of defects are formed at location #4 in photo above. The new SN-100 Series photoelectric scanner automatically "sees" these defects at #5 area. This actuates #6 spring, wherever crack is present — to mark defect with paint.



MAGNAGLO INSPECTION VARIES TO FIND *ONLY* WHAT YOU WANT TO SEE!

After you decide what constitutes your own serious flaw, Magnaglo can help you achieve consistent quality in production. The magnetizing current and Magnaglo application can be varied and controlled to produce exactly the degree of sensitivity required for your quality standards. The photos above show the same billet inspected under varying techniques and amperages, to suit different billet conditioning needs.

Note: variance of intensity of the Magnaglo indications. You can show or *not* show any depth seam you require, for each job you run.

Zyglo can be similarly employed on non-magnetic billets, to increase yield and lower conditioning costs.

HALLMARK OF QUALITY IN NONDESTRUCTIVE TEST SYSTEMS

Write for complete details concerning any of the above case studies or other tests in mills. Also, ask for our new booklet on "Lower Manufacturing Costs."

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UNITED STATES / A SINGLE **TRANSFLEX** PRESS WITH MULTIPLE SLIDES

How Two Automotive Companies Produce Wheels AUTOMATICALLY with . .

The TRANSFLEX press above is built on the modular principle. That is, if major changes in production are called for, the units comprising this machine may be rearranged, split up, or added to so that a completely different production system may be constructed from this basic machine.

However, ordinary design changes are taken in stride by this machine. The feed is TRANSFLEX. By simple adjustments, the machine can be set up to run parts of different size and shape.

All operations from the blank to the finished part are automatic including feeding, unloading and the movement of parts between stations. The economy of this machine is clearly demonstrated when it is understood that a single drive operates the four slides. A single mechanism handles the pieceparts from start to finish. With all actions powered by a single drive motor, the press operates continuously. Maximum output is achieved and less maintenance is required.

TRANSFLEX can give you press automation *for a variety of parts.* Modular construction can give you a completely automatic transfer feed press without fear of long range obsolescence.

CLEARING PRESSES

CLEARING MACHINE CORPORATION



ENGLAND / AN INTEGRATED **TRANSFLEX** LINE WITH SEPARATE PRESSES

TRANSFLEX

Production requirements for the British firm that uses the press shown above dictated a high degree of flexibility and a more difficult-to-predict schedule for the future. This firm, a contract manufacturer, produces wheels for numerous European automotive firms. They wanted to have a part time automated press line which could be used intermittently as independent machines.

Their Clearing Transflex line gives them the versatility for manufacturing many types of wheels merely by changing settings of the feed mechanism. Each press has its own individual feed which is hydraulically driven and electrically synchronized with the entire line. If necessary this line may be added to or run as a three-press or a two-press line depending on requirements. Or, if necessary, the presses may be operated independently, either manually or automatically.

Both presses on these pages are fine examples of the way Clearing engineers can design TRANSFLEX (transfer feeding plus flexibility) to meet the specific requirements of any manufacturer.

Find out what forward-looking Clearing engineering can do for your manufacturing operation. Call Clearing today.

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FEATURE ARTICLES

Middle way to modernization—



AUTOMATIC loading and unloading on this gear checker helps to speed inspection. It checks for tooth depth, nicks, runout and backlash.

Photo courtesy Chrysler Corp.

How Automatic Loading Lifts Job Profits

By W. G. PATTON, Engineering Editor

◆ As competition gets tighter, so do the areas for making a profit . . . But there's a "middle-way" out for small plants as well as large . . . It's by use of simple, and relatively inexpensive, automatic loaders for standard machine tools.

◆ Reports of their benefits vary, but their returns for the most part are highly encouraging — sometimes surprisingly so . . . Adding them is also a program for modernization and sound business practice.

◆ AUTOMATIC loading equipment, on standard machine tools is the "middle way" in modernizing a metalworking plant. It's often the way to hold your competitive position, earn bigger profits, improve product quality and lay the groundwork for a sounder business future.

Relatively simple loaders on machines like hobbers, gear cutters, gear teeth honers, checkers, shavers, broaches, and spline rollers pay for themselves by turning out better work faster and at a lower cost.

Most new machine tools ordered by high - production plants have automatic loaders, or are made to accept them later. But medium-size and small plants, too, are taking a closer look at their benefits.

Dearborn Gear and Tool Co. points up the case. This Detroit firm, makers of distributor and oil pump gears for the automotive industry, uses mechanical loaders on its gear shavers. These are the results:

(1) Output per machine - hour has taken a jump upward without

increasing the operator's work load.

(2) More than 3 million gears of one type were made without a rejected shipment.

(3) With no manual loading, the job is completely safe.

(4) Tools wear longer and break less.

(5) The operator is now free to check gears prior to shaving.

New machines get loaders

Automatic loaders on machine tools in automobile plants are already in widespread use. According to Michigan Tool Co., about 80 pct of its new domestic machine tools will be shipped with automatic loaders. It also is asked to build loaders for machine tools now in service.

Another machine tool builder also reports that nearly all of its new machines for the auto industry have automatic or semiautomatic loaders. Those that do not are being made to add them later.

Some firms are taking what might be called a "half step" toward automatic loading. Saginaw Steering Gear Div., for example, loads indexing tables manually for several of its machining operations. If it becomes desirable to use mechanical loaders, these setups will need only minor changes.

Mechanical loaders for some machine tools are profitable even when they don't shorten the time cycle. Where this is the case, savings stem from (1) steadier production, (2) higher quality, and (3) ability of an operator to run more than one machine. With automatic loaders, it's not unusual for production to double.

As with other automatic equipment, the mere purchase of a loader is neither a promise of its possible benefits nor a cure for all problems. It should be applied to the right job in the right way.

The greatest savings are gained when loading time consumes a fairly large part of the machine cycle. However, there may be little or no benefit from an automatic loader if the operator's free time cannot be used profitably elsewhere.

Another factor to consider is that loaders and unloaders may introduce new troublespots. This may be due to variation of parts, their shape, or the very nature of the operation. Make sure the device works on regular production parts before you commit yourself. First ask: Is the part likely to change during amortization? If so, what changes must be made in the equipment? And how much will such changes cost?

Here's How MANUAL and AUTOMATIC Loading Compare

Operation	MANUAL	AUTOMATIC
Shaving Time	11 sec.	11 sec.
Loading and Unloading	10	2
	21 sec.	13 sec.
Pieces per Hour	at 80% efficiency **137**	at 100% efficiency **277**

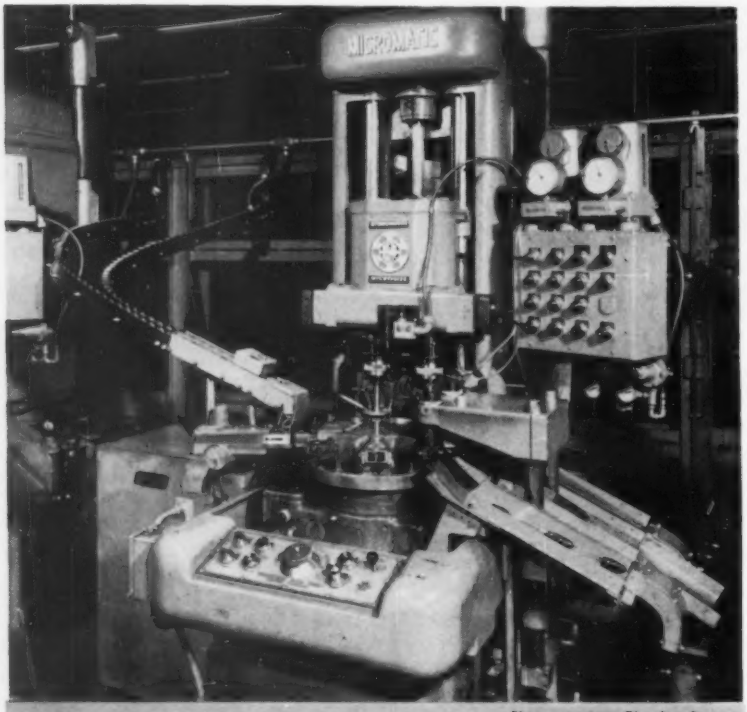


Photo courtesy Chrysler Corp.

PART of a fully integrated line, this machine automatically hones and checks transmission gears to accurate size.

Points to watch

Many firms experienced in designing, building and using mechanically-fed machine tools caution: Don't underestimate your ability to do things mechanically. G. R. Fitzgerald, Director, Process Development Section, General Motors Corp., emphasizes the importance of the economic side of automatic equipment. "Experience . . . has led us to believe that the greatest prob-

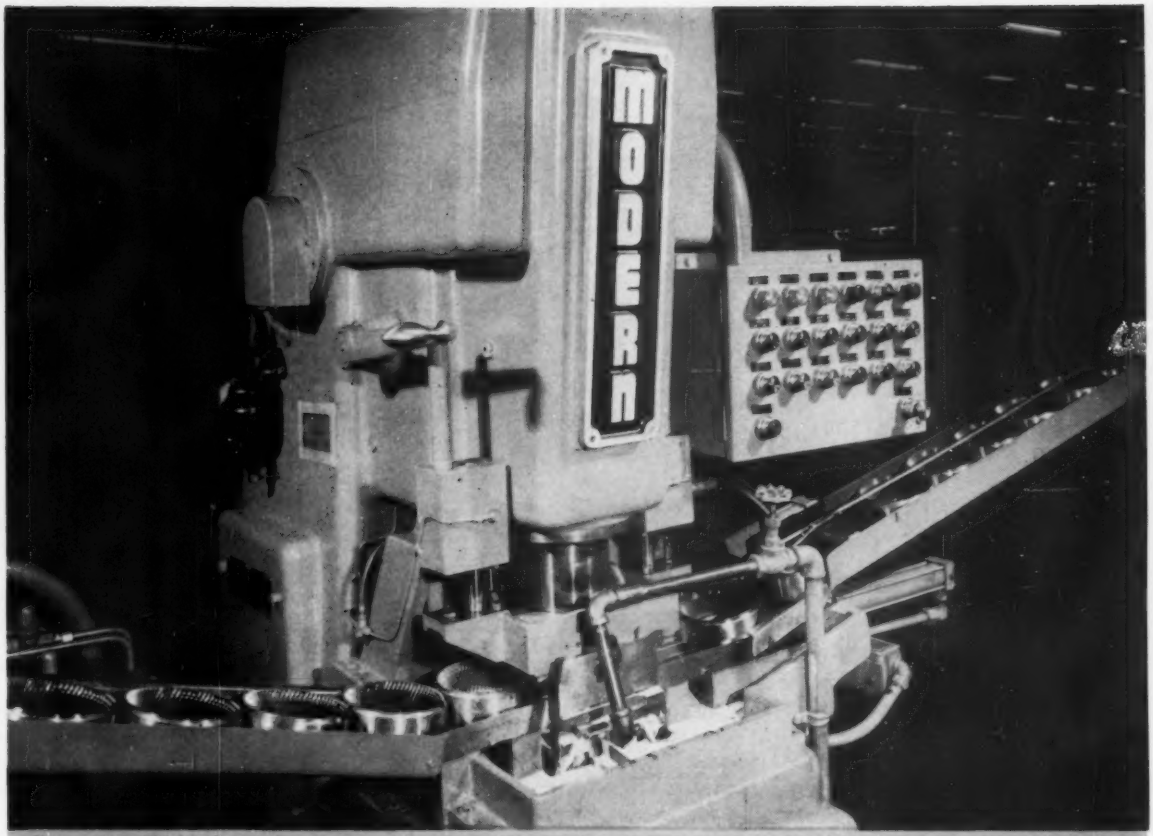


Photo courtesy Chrysler Corp.

FEEDING and ejecting parts automatically on this machine cuts down processing time. It removes burrs after broaching.

lems in the use of automatic assembly equipment are economical rather than mechanical. If the economics . . . are favorable for automatic assembly, the mechanical problems can usually be solved."

Before making a decision whether to buy or not, examine (1) your present setup, (2) type of operation and length of run, (3) adaptability of your present machines to automatic loading, (4) availability of new machines with automatic loading.

Where automatic loading pays off, the returns are good. Often, there's too much emphasis on production and too little on economics.

Industrial analysts also point out that newly acquired automatic equipment often creates new accounting problems. They warn that the usual percentage-of-direct-labor method of allocating charges may not logically apply to the new condition. Check to see that your accounting department gives your new setup a fair break costwise.

Failure to analyze your present situation correctly may lead you to entirely erroneous conclusions. Here's an example: Let's say you're operating three machines and you expect a new loader on one of these to increase output by 50 pct. On the other hand, some simple changes in your manual setup may increase production of each machine by 20 pct.

Other considerations

Perhaps semiautomatic loaders can do the job. If so, will the rate of return equal or exceed that for fully automatic equipment? Use the equipment that keeps pace with the production line.

Here's the way one large firm goes about studying such problems:

(1) It develops alternate ways of doing the job and evaluates costs carefully.

(2) Determines whether existing manually-loaded machines can be used more efficiently. This may be done by a film study.

(3) Looks for possibilities to combine manual and mechanical operations.

(4) Seeks the simplest, all-mechanical solution.

Studies like this, coupled with investment analyses, inevitably show that equipment costs can increase faster than labor costs are reduced. When you reach this limit, further automation costs money.

Avoid comparing only the present method with a new, fully mechanized method. Shop around for "in-between" techniques that may earn you an optimum return.

How efficient are some of the machines equipped with automatic loading and unloading devices? The standard Red Wing gear shaver, made by National Broach and Machine Co., feeds gears from a magazine. The operator merely keeps it filled. Gears are then automatically gaged, fed and positioned in mesh with the cutter, shaved and unloaded.

Such machines pay for them-



Photo courtesy Chrysler Corp.

AFTER manual loading onto chute, parts feed automatically into this spline rolling machine. No other manual handling is needed.

AUTOMATIC LOADING *continued*

selves from savings in direct labor costs. They also feature safety, and take less floor space since fewer machines are usually required. Gear quality, too, is substantially improved.

It's not difficult to justify fully automatic machines for high production runs. Moreover, using an automatic loader, the operator frees himself for inspection and deburring.

An internal gear shaver with semiautomatic loading, also built by National Broach, not only speeds operations but eliminates many of them. The operator merely hangs the gear on the cutter, presses the control button and the machine cycles automatically. The operator then removes the part from the machine.

The machine clamps the gear, and after shaving it, retracts the cutter head, then releases and ejects the gear so the operator can remove it easily. It does this at the rate of 109 pieces per hour compared with a previous rate of 80. The operator has only three functions as opposed to nine on a manually-operated machine.

Several Micromatic honing machines at Buick Motor Div. load and unload parts automatically. Soft blanks for small transmission gears generate a round, accurately sized bore before the teeth are cut. After the teeth are cut, and the gear hardened, the bore is again honed. This corrects distortion caused by heat treating, generates final size and produces the desired surface finish.

Each operation removes from 0.0007 to 0.0019 in. of stock. Size is held to less than 0.0002 in. tolerance automatically with Gage Ring Microsize control. Feeding from a storage cabinet is also automatic.

A double spindle machine can produce 600 gears per hour. A single spindle machine hones about half that number.

Handling input shafts for Chrysler's PowerFlyte transmissions is somewhat like handling steel jackstraws. It's not simple, particularly since three splines must be rolled on the same shaft while passing through three machines.

Michigan Tool Co. Roto-Flo spline rolling machines do this job. They have automatic work feed devices and are linked together by chain conveyors. The rack-type forming tools produce splines and oil grooves in axles and shafts by so-called "chipless machining."

At Chrysler's Indianapolis plant, conveyors carry the input shafts in wire trays to the first station. The shafts are then fed manually on to a feed chute. The parts roll down the chute by gravity and are loaded automatically into the spline rolling machine. They require no further manual handling.

Production on the three machines is 285 shafts per hour. Splines cold rolled on the shaft have 24 teeth, 19 teeth and 21 teeth, respectively.

Another example is at Saginaw Steering Gear Div. where a Barber-Colman machine hobs precision steering worms. The loading magazine at the back of the machine holds 20 to 25 pieces. An arm moves forward with the blank. Clamping is entirely automatic. Machined parts are released and removed without manual assistance. Using this type of loading, these machines turn out more than 100 pieces per hour.

Does six jobs

A Brown and Sharpe single-spindle screw machine with automatic loading speeds the making of spark plug worms at AC Spark Plug Div. Parts are hopper fed to the loading station. The machine performs six operations, including shaving, spot drilling, straightening and boring of the part. All work on this machine is done at the cut-off end of the blank. Automatic loading has

increased production and improved quality.

Another example at AC Spark Plug Div. where mechanical feeding helped to improve efficiency is on finish grinding of the first worm of a speedometer. Blanks made on an automatic screw machine feed from a vibrating hopper down a track to a Cincinnati centerless grinder. Production has been steady and quality uniformly excellent.

Rolling a head on a small steel pin at AC Spark Plug Div. is a classic example of high-volume production. Dual rotating barrel type hoppers feed parts down tracks at opposite sides of a rotating table. Half the dies are in the rotating table (as cams). Each time the table rotates, 16 parts are made. It's an ingenious setup with which a manually loaded machine cannot compete.

Automatic loaders out-produce manual loading by many parts per hour. Here the control system paces the job—not the operator. After setting up, the operator merely keeps the magazine filled and removes finished parts.

With batteries of shavers, for example, lights signal when more parts are needed. Thus, one operator can handle more machines—all of which produce parts at a steadier rate. Cutter life increases, particularly with integral gaging.

Loaders for gears fall into three general types:

(1) Rocker type for gears up to 2 in. diam.

(2) Slide type, for medium-size gears and shafts.

(3) Straight line type—for large gears, including cluster gears. Gears up to about 6 in. pitch diam can now be handled automatically.

How types differ

The rocker-type loader has three principal parts: a sizing gage and storage magazine, a pivoting transfer plate and an unloading finger. Some loaders of this type have an air cylinder piston arrangement that simultaneously releases finished parts and delivers new parts to the cutter.

Slide-type loaders differ from the rocker type in one important respect. The transfer unit consists of a horizontal slide instead of a pivoting sector plate. This allows handling of comparatively large gears.

Straight line loaders are designed primarily for large gears. They permit the use of the full vertical open height capacity of the machine.

Multi-spindle bar automatics serve as another example where efficiency can be boosted by the use of automatic loading. One such machine recently developed by Lipe-Rollway Corp. automatically indexes to as many as eight fixed-stop positions. It stocks several hours' bar supply, ejects remnants and reloads automatically.

This machine's efficiency rates at about 96 pct of total operating time. By comparison, similar machines with conventional feeds have an efficiency slightly under 70 pct.

The bar feed consists of a diagonally positioned stock rack and a reel with four to eight split stock-tubes, depending on the number of spindle positions. Air-operated motors, one to a spindle, power the pushers which move stock against the collet jaws.

Other features of the machine include air-operated braking which stops the reel when it reaches the proper index position, an hydraulic check unit to control stock feed out at a constant rate, and a safety shut-off to stop the machine if it should jam.

With rack storage of bars to keep the machine going for several hours, and the machine being completely automatic, the operator is free to take care of other jobs. In fact, the rack can be reloaded at any interim time. Loading of a stock tube from the rack takes about one-half second.

Where greater loading capacity is needed, just add a simple auxiliary rack. It's interesting, too, that where actual machining takes 10 seconds or more, a new bar can be loaded without shutting anything off. A machine of this type accommodates bars from ½ to 2 in. diam.

Coincident with the problem of developing automatic equipment is the problem of training personnel in its use and maintenance. Often, the training program can be set up in cooperation with the equipment supplier.

Savings through the use of automatic loading devices are often on the high side—sometimes surprisingly so. They may be well worth looking into whether your plant is large, small or in-between.

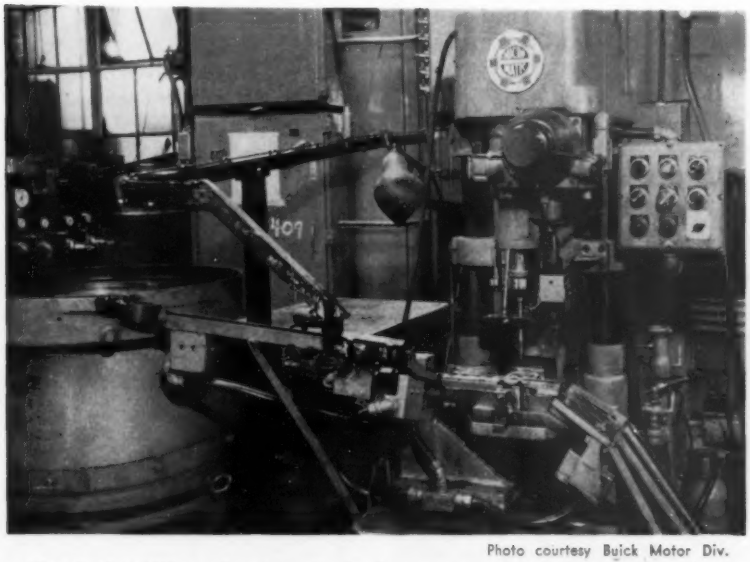


Photo courtesy Buick Motor Div.

GEAR BLANKS feed automatically from storage unit to honing machine where an accurately sized hole is generated before teeth are cut.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept. THE IRON AGE, *Chestnut & 56th Sts., Philadelphia 39, Pa.*

Continuous heating and cooling—

Tunnel Annealing Furnace Speeds Stainless Parts Production

♦ A new annealing furnace, heated by radiant burners, is making the in-process annealing of TV tube housings more efficient . . . Metallurgically sound, the short heating cycle falls into line with continuous assembly methods.

♦ Here's an application that can be readily adapted to any number of cold forming operations where in-process anneals are mandatory. Labor saving, the entire installation is handled with ease by a single operator.

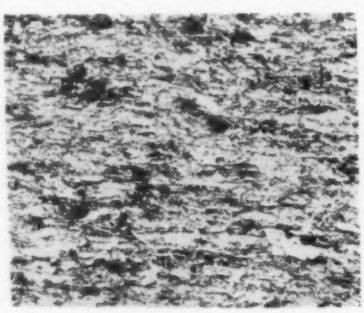
By P. M. UNTERWEISER, Metallurgical Editor

♦ A NEW, tunnel-type annealing furnace is making it possible for a metalworking plant to switch from a conventional long-cycle anneal to an extra-short cycle requiring only 3 minutes. The material being annealed is a titanium-modified Type 430 stainless. The end product is a spun stainless housing—a cone-shaped affair—intended to contain the innards of a TV picture tube.

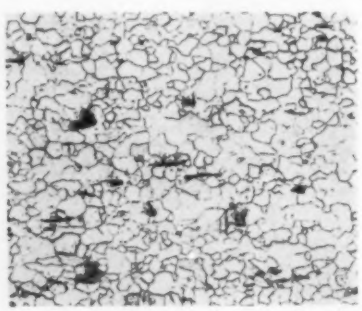
The furnace, designed and built by Selas Corp. of America, is now in full-swing production at I-T-E Circuit Breaker Co.'s Special Products Div., Philadelphia. In addition to speeding production, it has resulted in an overall reduction of scrapped housings. Scrap rate has been materially reduced.

The need for the annealing cycles stems from the fact that the stainless housings are formed in a series of spinning operations. The spinning (or cold shearing), accomplished on special lathes, is a type of severe cold forming which tends to work harden the steel and markedly reduce its ductility. Annealing serves to restore this ductility for additional forming operations without the risk of brittle breaks in the material.

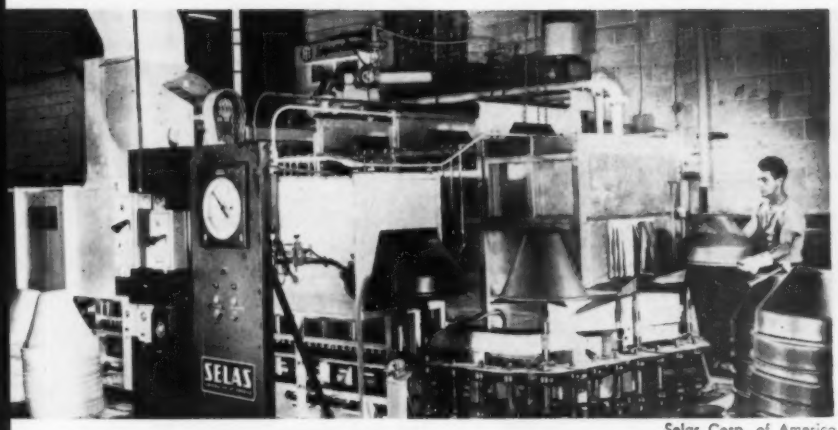
At the present time, I-T-E is turning out TV tube housings at the rate of about 120 per hour on



After automatic spinning operation, grain structure shows the effects of severe distortion.



A short-cycle anneal restores the original grain structure without grain coarsening.



Selas Corp. of America

New tunnel annealing furnace provides a continuous, short cycle for annealing work-hardened TV-tube housings made of Type 430.



I-T-E Circuit Breaker Co.

Automatic spinning lathe handles tough forming job speedily.

a continuous, assembly-line basis. The housing starts out as a circular plate approximately 21½ in. diam. and 0.125 in. thick. The plate stock, a modified Type 430, is received at the plant in the annealed condition.

The plate is first adequately lubricated and then positioned for forming on a specially built lathe. Spinning is accomplished by forcing the metal progressively over a tool-steel mandrel. As spinning proceeds, the material gradually assumes the shape of the forming mandrel.

Work hardens

With this type of cold forming, stresses are especially severe. As a result, the chromium-base alloy work hardens considerably. Work hardening lowers ductility to a point where cracking can occur. Even the slightest seam or crack renders the housing worthless for TV-tube use.

Two in-process anneals are required to keep the housing sufficiently ductile for final forming. Previously, a batch-type furnace was used for annealing. While metallurgical results were reasonably satisfactory, output was inadequate to meet increasing production requirements.

The new, tunnel-type furnace not only speeds the annealing operations but also makes them continuous. The furnace is heated by radiant burners fed with city gas at a 6 to 1 ratio. Furnace temperature is held at about 1700°F.

Housings are fed mechanically to the entrance end of the furnace by rotating paddles. These paddles convey the parts through the 16-ft length of the furnace, rotating them as they move in order to provide optimum temperature uniformity. Process requires the housings to achieve a temperature of about 1600°F.

As can be seen from the photomicrographs, this short-cycle anneal is sufficient to provide a fully annealed structure without the coarsening effects of grain growth. The individual grains, severely distorted during spinning, are restored to their normal orientation. Mechanical properties are again comparable to those of the as-received material.

In addition to the heating chamber, the Selas set-up also makes provision for air-cooling the parts as they leave the exit end of the furnace. This is accomplished by routing the parts from the furnace to an enclosed cooling tunnel. By the time the parts are conveyed to the end of the cooling tunnel, their temperature is below 350°F.

One of the new installation's major selling points is the fact that it can be run by a single operator. Another advantage stems from the fact that the gas mix within the furnace tends to reduce surface oxidation of the parts to a minimum. Temperature uniformity is controlled by a Honeywell recording controller and platinum thermocouple.



I-T-E Circuit Breaker Co.

Here's the end product partially assembled: a color TV tube.



Left: DRY POWDER mix containing variously sized particles drops into funnel (center). Coarse fraction comes off at right.

New Machine Sorts Dry Powder By Particle Size

◆ Separating one size particle from another in a dry powder can present problems . . . Yet many metalworking processes call for just this . . . One new classifier achieves the precise split at 15 tons hourly.

◆ Operating continuously, the machine flings particles out from its spinning core, and into an opposed air blast . . . Light particles go one way, heavier particles another . . . All under an inert gas blanket if desired.

◆ SORTING a dry mix by particle size isn't an easy job. Yet it's essential in many metalworking processes. These include production of metal powder, ore beneficiation (of iron and uranium, for example), as well as topping of foundry clays, limestone and refractory materials.

A new classifier, as the sorting equipment is called, promises to simplify the task. With it, dividing (or topping) powdered material into fine and coarse fractions is relatively simple. An inert gas blanket can protect the entire process, if required, in a closed circuit that returns clean gas to the classifier for reuse.

Using high velocity air to balance centrifugal forces, such equipment can separate up to 15 tons of dry powder hourly into fine and coarse batches. The compact machine will sharply divide a dry mix into two fractions at any cut-off point within its range, nominally 15 and 110 microns. The actual size range depends on the material.

Separate fines easily

Five such classifiers already are in service, according to the builder, The Sharples Corp., Philadelphia.

Three factors complicate the grading of powder by particle size: cutpoint, product yield and throughput. In the past, these three seemed to conflict with one another. An efficiently designed air vortex has led to successful combination of cutpoint and high efficiency with high capacity.

Cutpoint refers to the ability of classifiers to distinguish between large and small particles. The sharper the cutpoint, the better. Ideally, after classification, all particles larger than a certain size will collect in one bin, all those smaller in another.

This air-vortex-type equipment sharply divides one particle size from another. Fine fractions with a top size in the 15 to 20 micron range will contain less than 0.04 pct residual particles of 325 mesh screen size and larger. Cutpoint sharpness is not affected by throughput rate or size distribution of material fed into the machine.

Product yield refers to the percentage of particular size particles recovered from the total contained in the mix. Yield with this air-vortex equipment is high, ranging from 80 to 90 pct. Pro-

duction runs with equipment set to gather material less than 15 micron particle diameter have resulted in 97 pct recovery. Yield efficiency remains unchanged regardless of throughput rate or size distribution of particles in the feed.

Hourly throughput of dry powder ranges from 1000 to 30,000 lb among four models of varying capacity. Even greater throughput is possible.

The principle behind the classifying equipment is basically simple. It involves balancing the centrifugal forces flinging out the particles against air spiraling inward from the machine periphery. Air enters through vanes spaced around the machine edge, pulled in by a downstream exhauster. Vane angles determine the cutpoint.

Unclassified material drops into the intake funnel of the equipment from a conveyor. The funnel is located at the axis of a spinning wheel.

The dry powder falls upon the rotating powder distributor, which somewhat resembles an impeller. From this distributor a number of powder feed tubes lead outward.

Centrifugal force of the rotating distributor and feed tube assembly carries the variously sized particles outward. The particles move through the powder feed tubes, and drop from the tube nozzle into the classification zone. There the sorting process begins.

Float in air blast

As particles fall into this zone, they meet high velocity air, spiraling inward toward the machine core. If the individual particle is smaller than a preselected size, the air blast overwhelms the particle's centrifugal energy, and whips it toward the center of the machine and down through the fines discharge scroll.

Heavier particles with greater centrifugal energy continue their outward progress against the air blast. They lodge in collector rings at the outward extreme of the classification zone. From there they move into the coarse discharge outlet port.

Particle weight is not the sole factor in this process. Specific gravity of the material also enters. This affects the range within which the classifier can work efficiently.

With materials of 2.5 sp gr, the machine can adjust to turn out a fine fraction with a top size anywhere from 16 to 65 microns. If the specific gravity is 1, top size of the fine fraction can be set between 25 and 100 microns. Depending on circumstances, the classifier generally will handle particle separations in the size range of about 15 to 110 microns. It will go lower than 15 microns on denser materials.

Cut friction effects

Powder is brought up to speed of the air vortex before feeding into the classification zone. The spinning feed tubes do this.

Frictional effects are largely eliminated. Top and bottom plates of the zone rotate at the same velocity as the air, cutting drag to a low level.

The cutpoint remains constant throughout the classification zone. Inwardly converging contours of the zone make this possible. Air velocity thus increases as it spirals inward. This maintains a constant relation between contrifugal force and drag force.

Where the high velocity of the powder might encourage abrasion and wear, inserts help keep down maintenance costs. Powder feed tubes and coarse collector rings both are replaceable.

Operational adjustments while the equipment runs are unnecessary. To change the cutpoint, merely insert a different size vane set.

Operation is continuous. Once a run starts, little operator attention is needed. Instrumentation consists of measuring the air flow rate and pressure differential across the system.

Changing from one material to another is relatively simple. Altering vane angle, and possibly rotor speed and air volume, does the job.



SPINNING distributor wheel beneath funnel flings particles outward and into air vortex of classifier. Air entry vanes show around periphery.

How Troubleshooting Makes Bending Easier

◆ You can troubleshoot your way to better bends by knowing precisely where trouble can strike in the press shop . . . Here's help in doing this.

◆ Trace causes of poor bends back to the workpiece, tooling or press operation . . . From there, this listing aids in pinpointing the trouble.

By FEDERICO STRASSER, Consultant, Santiago, Chile

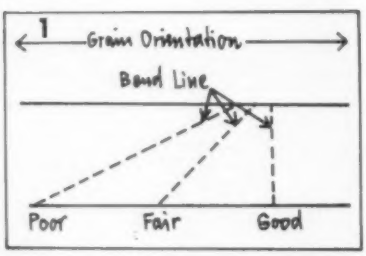
◆ PRESS ROOM troubleshooting doesn't always follow a set pattern. Varying conditions from shop to shop, and often within the same shop, makes this so. Nevertheless, there are enough common troublespots where practical tips can help most shops.

In bending and simple forming, trouble can originate in the workpiece itself, the tooling or the operation. This last includes performance of the press equipment.

When designing the workpiece, consider chiefly (1) blank shape, (2) bending radii, (3) which blank surface faces up, (4) kind of metal and its temper, and (5) grain orientation of the rolled sheet or plate. Each is a potential source of trouble.

Generous bending radii have proved essential for good bends. Working stresses are thus distributed over a larger area.

Bends sometimes must have sharp corners for functional or

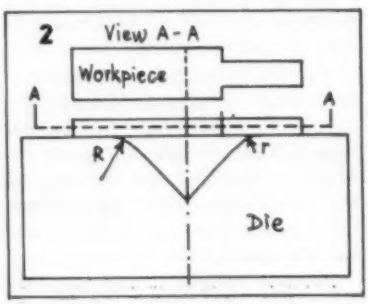


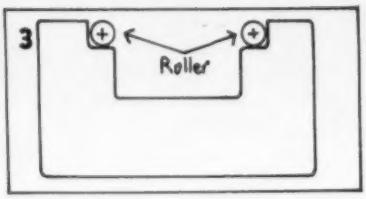
aesthetic reasons. In such cases, stamp the workpiece first with rounded corners. Sharpen the corners in a second and separate operation on an ironing die.

Asymmetric parts are difficult to bend. This comes about through varying friction on areas of the workpiece as the press ram descends.

An example of this is the workpiece with two legs of differing width or length. The greater friction of the wider leg delays its bending progress somewhat with respect to the narrower leg. The wider leg consequently becomes longer than it should be. To avoid trouble, use special tools such as the blank holders mentioned later.

Design workpieces so the burr side of the blank faces into the bend. On a blank, the burr side is weaker than its smooth side. By bending the weaker side inward, you run less chance of fracturing the sheet under press stresses. The compressive stress inside the bend is easier to withstand than the tensile stress on the outside.

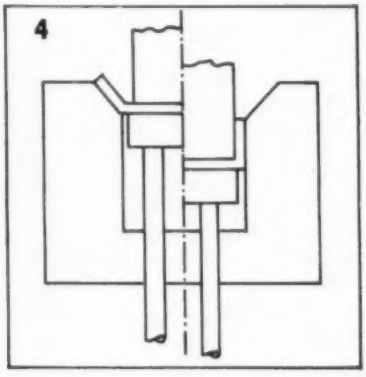




Proper positioning of the burr face is most important with relatively narrow and thick workpieces.

In selecting material and specifying its temper, choose the most ductile sheet that meets stiffness, rigidity and strength requirements.

When laying out the flat blank, make sure to bend at right angles to the grain orientation of the sheet (Fig. 1). Grain orientation refers to the direction in which



the material lengthens when rolled.

Compound bends at right angles to one another may make such layout impossible. Then, lay out bends at 45° to the rolling direction. Avoid bends paralleling the rolling direction.

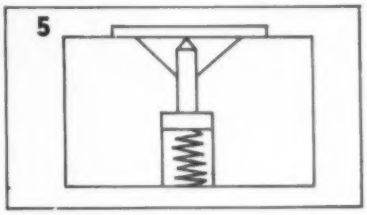
Question design, tooling

Troubles originating in tooling for presswork fall into several categories. Ask yourself (1) Are bending edges on dies properly rounded? (2) Will replaceable inserts at the bending edges help? (3) Are holding pads called for? (4) Can ejectors and stops ease the work, improve accuracy of bending?

Bending edges of the female die must be rounded as much as possible within reason. This should be at least four times the material thickness, if practical.

Asymmetric workpieces can cause trouble. Excessive rounding of certain bending edges on the die may sometimes overcome this difficulty. By over-rounding that die edge corresponding to the wider leg of a two-legged workpiece, the entire bending operation can be improved (Fig. 2).

When working with high-strength sheet, try replaceable inserts at the die edges. Hardened rollers frequently work even better (Fig. 3). With rollers, friction between the part and die is



less than with stationary edges.

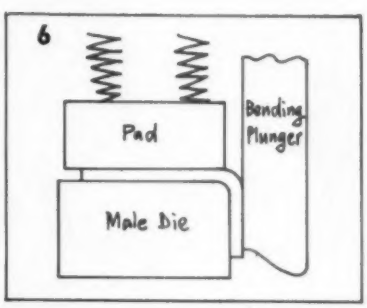
Preforming blank edges helps in channel-forming and U-bending, especially if the stock is rather thick. There's usually no need for a separate press operation here. Instead, alter the form of the bending edges from a rounded surface to a 45° chamfer.

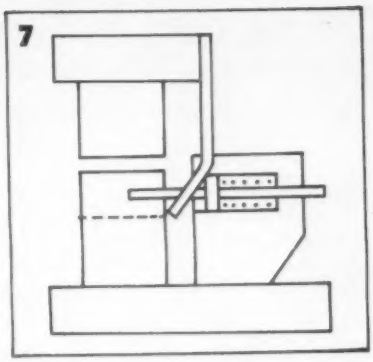
Try blank holders

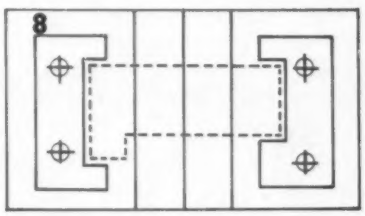
In this way, you avoid changing blank contours abruptly. At first, the blank bends smoothly on a large lever arm (Fig. 4, left). On further descent of the punch, the channel or U-bend is completed.

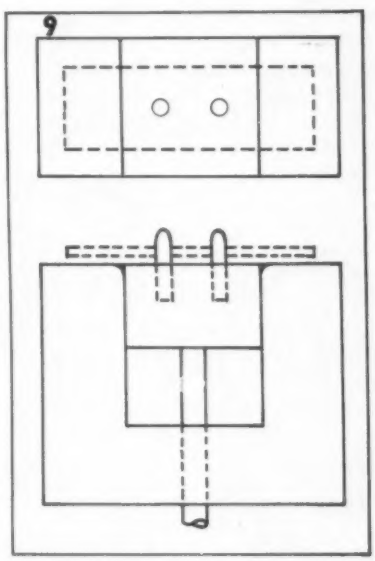
In U-bending, as in simple V-bending, inserts or rollers may be used at the working edges of the female die.

Blank holders can make difficult bending jobs rather easy, including those on asymmetric workpieces. The holder engages the blank before the punch touches. It clamps the blank firmly throughout bending, avoids blank









movement and workpiece misalignment that can result.

The simplest form of blank holder is a pointed, hardened pin protruding from the female die (Fig. 5). A coil spring permits necessary movement. In this design, the pin also ejects the blank after bending.

With channel-forming or U-bending, a rectangular piece of flat steel is often the holder (Fig. 4). Springs work it by pins.

Unbalanced workpieces with legs of unequal length and/or width bend satisfactorily on a tool like that of Fig. 6.

An automatic ejector in a bend-

"Bending involves plastic deformation . . . so it's always better to bend quite slowly . . . Slow bends may make the difference between success and failure . . ."

ing die can increase the production rate enormously. Hourly output, compared with manual removal, can easily double. Fig. 7 shows the design of one such ejector. The inclined arm attached to the punch holder operates the ejector.

Ejectors sometimes are difficult to scale down to the diminutive tooling required of small workpieces. Permanently magnetized punches offer another means of ejection in such cases.

As the punch ram ascends, the workpiece adheres to the magnetized male die and lifts automatically. On open press tools, removal by hand or a compressed air jet completes the operation. This method naturally applies only to magnetic workpieces, commonly iron or steel.

Locate with pins

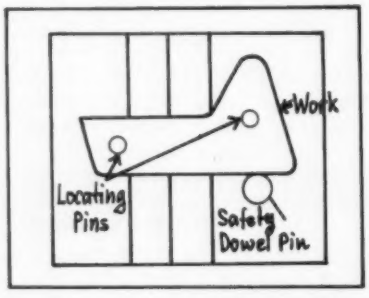
In bending, design dies to assure correct blank placement. This should be done in a manner that prevents blank placement in any but the proper position. Use of a nested female die or locating pins accomplishes this.

Nesting holds the blank in place by a plate with an opening corresponding to the external contours of the workpiece. The nest must not touch all points on the blank periphery—only critical locations (Fig. 8).

Irregularly shaped stampings and those involving several bends call for use of dowels. Here, locating pins match pierced holes in the blanks (Fig. 9). As shown in Fig. 10, a strategically placed safety dowel makes it impossible to insert blanks wrong side up.

Pressroom troubles can originate not only with tool design, but also in the way the tools are made. Two details should be closely checked. All die surfaces on which the workpiece slides or moves should be very smooth. Uniformity not only of the rounding radius, but also of the bending edge along its length will contribute greatly to efficient bending.

10



In press operation, several factors are potential troublemakers: (1) blank lubricant, (2) press speed, (3) blank feed, (4) cleanliness of tools, and (5) condition of the blank.

Select the lubricant for use in bending that is recommended by the supplier. The stock, its temper and finish, and other factors will determine the one best used.

Bending involves plastic deformation of the metal, so it's always advantageous to carry out the operation quite slowly. Indeed, the difference between success and failure in specific bending jobs is often only a matter of slower ram speed.

Boost bending rate

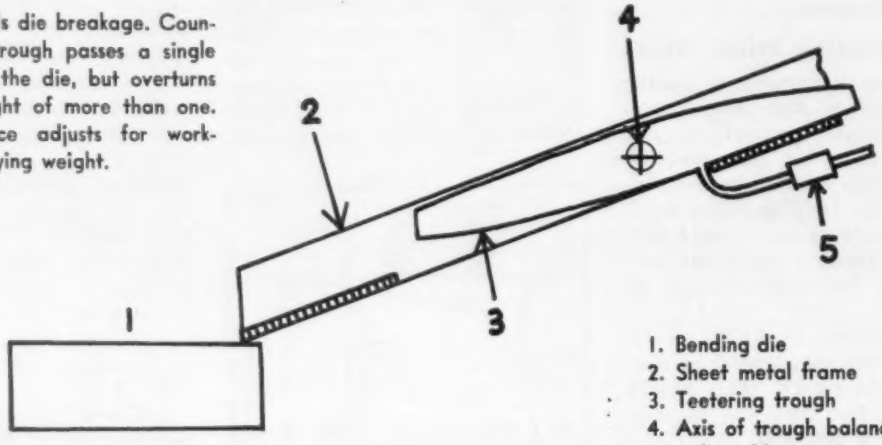
Bending operations are considered slow. Efficiency may be increased in a number of ways, including installation of automatic or semiautomatic feeding. If even these devices are not feasible, consider at least use of a feeding chute. Fig. 11 shows one design.

Difficult bending operations may call for special procedures, such as tumbling, annealing or heating of the blank. Tumbling eliminates blanking burrs and helps increase strength of the blank under press stresses. On short runs, filing or grinding may prove more economical than tumbling for removal of burrs and sharp edges.

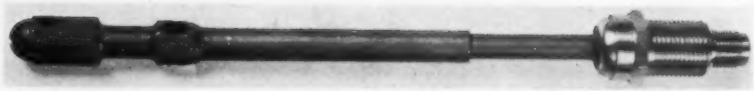
Bending at higher-than-room temperatures is occasionally demanded. Both blank and tool are sometimes heated. The temperature increase lowers the metal's tensile strength and simplifies the bending operation.

FEEDER avoids die breakage. Counterbalanced trough passes a single workpiece to the die, but overturns with the weight of more than one. Counterbalance adjusts for workpieces of varying weight.

11



1. Bending die
2. Sheet metal frame
3. Teetering trough
4. Axis of trough balance
5. Adjustable counterweight



CHROMIZED to resist oxidation, telescopic end fitting of SAE 4130 low-alloy steel withstands temperatures to 925°F.

A partial answer—

Extreme Temperature Tests Show How Metals Wear

◆ HOW METALS RESPOND to high and low temperatures often tells whether or not the product will work in service. Teleflex, Inc., North Wales, Pa. is concerned with what happens between —100° and +2000°F when one metal rubs against another.

For example, under high temperature testing, the temperature of stainless steel conduit jumps about 25°F above normal operating temperatures just before galling begins. AISI-SAE 4130 low-alloy steel conduits, the firm finds, perform well up to 1000°F without galling—after the proper surface treatment.

Although tests at Teleflex deal directly with performance of flexible cable within conduit, its results should prove helpful to others as well. The problems of rubbing friction have always worried most engineers.

Withstand corrosion

Early tests on AISI type 304 stainless conduit supplied by Superior Tube Co., Norristown, Pa., showed that operation was satisfactory up to 600°F. Wear, the limiting factor here, is negligible.

Type 304 resists corrosion and scaling. This, and its ready adaptability to Teleflex forming methods, makes for excellent conduit performance at temperatures from —100° to +600°F.

Various tests prove Inconel to be excellent for high temperature conduit service. It retains good strength and resists scaling at unusually high temperatures. The experiments brought out a surprise. The coefficient of expansion of Inconel conduit checks out closer to that of stainless steel cable than do types 321, 304 or 347 stainless steel conduit.

Most successful high temperature experiments have been made with AISI-SAE 4130 low-alloy steel conduits, also supplied by Superior Tube. SAE 4130 won't gall, even at temperatures up to 1000°F. It has good workability in the annealed condition, and it can be hardened by heat treatment. The material also costs considerably less than the higher alloyed stainless and Inconel conduits. Its only serious drawback is a readiness to oxidize at higher temperatures.



TESTED at temperatures up to 2000°F, metallic conduit submits to 80 "push-pull" motions per minute by cable running through interior.

Control oxidation

Teleflex sought to overcome this oxidizing tendency with various metal surface treatments. Surface treated 4130 can resist corrosion and scaling to a high degree. Eventually, treated 4130 will replace types 347 and 321 stainless in conduit use, it's felt.

Low temperature tests reveal some important facts. SAE 1060 cable embrittles at —40°F, and the hard material then causes increased wear of its aluminum conduit. Replacing the aluminum with type 304 stainless conduit solves the wear problem successfully.

From such tests as these, Teleflex has developed a phosphor-bronze flexible cable with self-lubricating properties that withstands temperatures up to 600°F. Now it's working on remote controls for service at 1000°F.

Final test results give some indication of how susceptible the materials are, in combination, to galling and to wear.

Two men replace six—

Forward-Storage Conveyors Cut Shipping Costs

◆ Any plant's warehousing/shipping operations can get creaky and outmoded if left alone too long . . . Is another "patching up" in order? Or is a modern, freshly-designed system the answer? . . . Each plant must find its own answer.

◆ Opportunity to build a new plant gave a plumbing supply company carte blanche in setting up a conveyorized forward-storage system . . . Result: First-in, first-out shipping and higher productivity.



PACKAGED fixtures from production areas are routed onto fingerlike "accumulator" lines (left) according to size. Conveyors then carry same-size cartons, in economical lots, to carton sealer.

◆ APPLY some imaginative thinking to your industrial warehousing and shipping operations and you also take a long step toward rolling back operating costs. Often, the slimmer inventory look which more efficient handling gives can save space as well.

Proof is offered in the experience of Union Brass & Metal Manufacturing Co., of St. Paul, Minn.

A manufacturer of brass plumbing fixtures, this company has found that careful planning of a handling system which includes roller, wheel and power belt conveyors has resulted in:

(1) Increased manhour productivity of warehousing and shipping personnel—an average 100 pct or more.

(2) Greatly eased inventory control and easier maintenance of a first-in, first-out shipping schedule.

(3) More space, proportionately, for manufacturing, since the improved system is more compact and efficient.

Further, the new system permits two men to conveniently handle shipping that formerly kept six men hopping when manufacturing was done in a separate building.

Union Brass management recognized some time ago the need for doing something about their growing warehousing and shipping problems. They determined that a new plant and layout could net them important operating-cost savings.

Made special studies

When the go-ahead was given on building a new plant, special studies were made of warehousing and shipping areas. A representative of a conveyor manufacturer, Rapids-Standard Co., was called in as consultant and was asked to analyze the problem. The recommended program was then incorporated into the new building plan. The result has been a smooth-flowing operation from the time fixtures emerge from assembly lines until they leave the shipping dock.

Plumbing fixtures are assembled and packaged at the individual work stations. The cardboard cartons of parts are then



LIVE-ROLLER conveyor runs between order-selection accumulator lines, simplifies order picking. System helps company fill more than 100 orders daily.

transferred to accumulator lines of roller conveyor. These extend outward at right angles, like fingers, from a belt conveyor. Each accumulator line holds one size or type part.

Accumulate in lots

Cartons are allowed to pile up on accumulators until a sufficient quantity of one size has been gathered. Accumulator lines are then released, one at a time, to permit cartons to flow at an even rate onto a 33-ft power belt conveyor. This shuttles cartons along further to a gravity flow roller-conveyor which carries them to—and through—a case-sealing machine. One such machine suffices for the whole job, and is set for one case size at a time.

After they emerge from sealing, cartons are placed on plywood flats on one of three "roller bed" trucks. These are hand trucks having two sections of gravity rollers.

Loaded plywood flats are then manually rolled from these trucks onto storage track accumulator lines (left side of diagram). These lines angle down slightly toward a central, powered-roller selection line. They simplify the job of order picking.

The slight downward pitch on accumulator lines serves to carry pallets toward the forward end of the lines for selection on a first-in, first-out basis.

The order picker's job is thus simplified. He has only to move along the aisle, choosing the proper cases from each storage line to fill his orders properly. The central, powered roller conveyor then takes the cases to wheeled conveyors, which shuttle them off to checking and shipping areas.

There are a total of 87 storage tracks, each capable of holding up to five tons of plumbing fixtures. Since the accumulators materially reduce the area required for the selection front, the order pickers can fill orders more rapidly, and with a minimum of physical effort.

Cartons "corner" on wheels

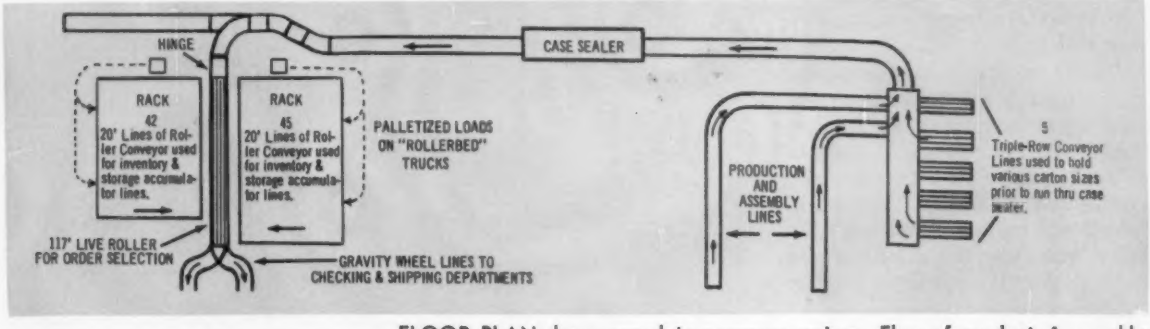
Conveyor equipment installed in Union Brass's new forward-storage system have several interesting features which contribute to a smoother-working setup. These are small items like case turners and unusual case stops. Case turners are simply small wheels, mounted at the junction of gravity conveyor lines and power belt units. They're on the "downward" corner of the junction, in terms of the direction of flow of the power conveyor. Their function is simply to catch cases and turn them more or less parallel with the belt.

Handles stop boxes

The case stops are simply small handles, which act to hold back cartons when they are swung into position across the top of the conveyor.

Altogether, there's about 1900 ft of roller conveyor used in the system, some 1740 ft of it for inventory accumulator lines. Other units include one 117 ft live roller conveyor, a 33 ft power belt unit servicing a series of accumulator lines, a case sealer, and a wheel conveyor which finds use at the shipping dock.

The three "roller bed" hand trucks used each have two 4 ft. sections of gravity rollers and four heavy duty castors.



FLOOR PLAN shows complete conveyor system. Flow of products is roughly counter-clockwise, from production lines (right) through accumulators and case sealer to order selection lines and out to Shipping.

Controlled metal removal—

"Transparent" Wheel Takes Guessing Out Of Grinding

◆ THINK about the advantages of a "transparent" grinding wheel. You know when to stop grinding, not by guessing, but by watching the wheel's action on the workpiece.

It'll give you fewer faulty parts, less waste from overgrinding and faster grinding. All this without protective goggles for the operator, since the full grinding wheel thickness is between the work and his eyes.

There's at least one grinder now available that offers these benefits. It does this by an optical trick that appears to make the grinding wheel transparant, according to the machine supplier, Carl Hirschmann Co. Inc., Manhasset, N. Y.

Watch grinding progress

The machine works for the same reason that makes motion pictures possible. Despite this simple explanation, the results are impressive. It eliminates the traditional job of grinding, removing the workpiece for inspection, regrinding and reinspecting.

Heart of the technique is the grinding disk. Of ¼-in. steel plate, the wheel carries six slots on its body, and six notches around the edge. It's faced on both sides with resin-bonded abrasive. This makes possible grinding first on one side, then reversing to grind on the other. The full abrasive surface of both sides is used.

On starting the motor, first the disk grows hazy then appears transparent. At top speed (3600 rpm), the operator looks through the wheel to the lower grinding surface and the tool beneath.

At such speeds, for practical grinding purposes, the wheel is solid metal. It's simply not possible to force the workpiece into any of the rapidly moving wheel slots. This holds true regardless of the angle of contact between the wheel and the work.

For similar reasons, there's no trouble with chipping of either workpiece or grinding wheel. One shop used a heavy granite block to prove this. After the wheel reached full speed, the thick granite slab was jammed against the wheel, not once but many times. No chipping resulted, even along the leading edges of the wheel slots.

The disk spins horizontally. This is merely a matter of worker convenience, and the machine can grind just as easily when mounted vertically.

The slotted wheel comes up with an unexpected bonus. Even under heavy load, temperature of both wheel and workpiece runs less than normally found when grinding with conventional wheels. The thinness of the disk and its slots help dissipate friction heat as rapidly as it forms. This helps retain the edge temper when working with tool steel.

Expect less trouble with heat checks in carbide tools for the same reason.

A number of wheel grits are available for cast iron, low carbon and alloy steels, as well as nonferrous metals. Diamond wheels require special ordering. Grits range from 60 to 280 mesh. Both surface finish of the workpiece and wheel life are reported to match those of conventional wheels.



OPERATOR looks directly through "transparent" grinding wheel, spinning at high speed. This permits close control of metal removal.

YOUR ORDER IS WELCOME

FOR 1 or 1,000,000 BEARINGS

PURCHASE ORDER NO. L-9473

THIS ORDER NUMBER MUST APPEAR ON YOUR INVOICE AND PACKAGE

YOUR **YC** COMPANY
ANYPLACE UNITED STATES

DATE 10/1/56

TO BOUND BROOK OIL-LESS BEARING CO.
Bound Brook, New Jersey.

REQ. BY 10/20/56

PLEASE ENTER OUR ORDER FOR GOODS NAMED BELOW

QUANTITY	DESCRIPTION	PRICE	
6	COMPO bearing #CS-754G1500 .69@	$ 4	14

REC'D OCT 2 1956 B. B. O. B. Co.

ACKNOWLEDGE ORDER AND STATE WHEN YOU WILL SHIP

NO CHARGE TO BE MADE FOR BOXING OR CARTAGE

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PURCHASING AGENT



NO PENALTY FOR SMALL ORDERS

Deliveries are prompt. (Immediate delivery for stock bearings.) Write for Stock List No. 4 today . . . . . .

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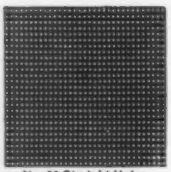
BOUND BROOK OIL-LESS BEARING CO., EST. 1883, BOUND BROOK, N. J.

Pioneer in

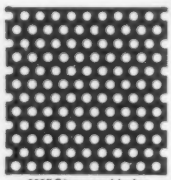
POWDER METALLURGY BEARINGS + PARTS

Perforated Materials for *Every* Application

Contact H & K for any perforated materials your product may require.



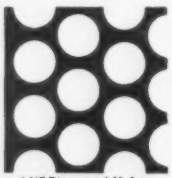
No. 00 Straight Holes
952 holes per sq. in.
.020" diam. 30% open.



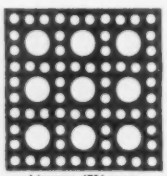
.060" Staggered holes.
126 holes per sq. in.
3/32" centers. 36% open.

We have tools for perforating thousands of different patterns.

We will be glad to work with you on your perforating problems.



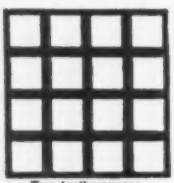
1/4" Staggered Holes.
5/16" centers.
.25" diam. 58% open.



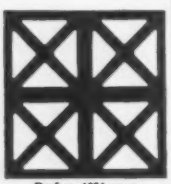
Lincane 47% open

See our catalog in Sweet's Product Design File.

Perforating all metals, Masonite, plywood, paper, cloth and plastic.



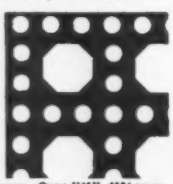
Two-tenths square,
64% open.



Perfex 40% open

Round holes, square holes, slots, ornamental patterns, oblong holes, oval holes.

Fill-in and mail coupon to office and warehouse nearest you.



Cane "41" 41% open.

THE **Harrington & King** PERFORATING CO.

Chicago Office and Warehouse
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Chicago 44, Ill.

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118 Liberty Street
New York 6, N. Y.

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- ☐ GENERAL CATALOG NO. 62
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- ☐ SAMPLES of Perforated Plastics and Paper
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TITLE_____

COMPANY_____

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CITY_____ ZONE_____ STATE_____

FREE AIDS

New Technical Literature:

Catalogs and Bulletins

Circular saws

Circular saws for non-ferrous metals are described in a new folder. These saws have a 75-in stroke. A power-driven roller conveyor at each side of the machines aids supply and removal of workpieces. Literature covers specifications, operation, chip removal, clamping, feed, etc. *Albert Klingelhofer Machine Tool Corp.*

For free copy circle No. 1 on postcard, p. 145

Heating problems

Solutions of difficult heating problems due to odd contour shapes, space and/or weight limitations are contained in a new series of folders. They introduce sprayed-on film type heating elements. These are lightweight (1/10-lb. per sq ft) and thin (about 0.015-in. thick). In addition the heating elements are resistant to electrolytes, water, oils, abrasion, and weather. *Electrofilm, Inc.*

For free copy circle No. 2 on postcard, p. 145

Steel wire

A 120-page manufacturers wire handbook features almost 100 types of steel wire. Sections are devoted to cover spring wire, ACSR core wire, strand wire, rope wire, high carbon specialties, shaped wire, wire for cold heading and cold forging, welding quality wire, wire for industry, mill practices and 21 different specialty wires. The latter range from aircraft cord wire to tire bead wire. *Pittsburgh Steel Co.*

For free copy circle No. 3 on postcard, p. 145

Dripproof motors

One to 5-hp dripproof and enclosed motors are illustrated in a 12-page publication. It shows production testing techniques and construction features. The color bulletin also describes servicing and installation advantages. *General Electric Co.*

For free copy circle No. 4 on postcard, p. 145

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 145.

Press brake die

Power press brake dies are described in a 48-page wirebound manual. It illustrates and describes the dies in most common use. The dies are grouped for quick reference, primarily by the type of bend involved. Included are special purpose dies, ordering information and many easy-to-use tables. *The Cyril Bath Co.*

For free copy circle No. 5 on postcard, p. 145

Vertical pumps

Colorful and 44-in. long, a chart pictures a cut away view of a vertical turbine pump with an open lineshaft. Separate cross-sectional illustrations show the pump's simple and effective packing assembly, bearing assembly with a removable stainless steel shaft sleeve, dual bowl bearings of rubber and bronze, and its sealing action. *Layne & Bowler Pump Co.*

For free copy circle No. 6 on postcard, p. 145

Company facilities

Company facilities and services for production of component assemblies for the aircraft industry are described in a four-page brochure. Equipment installed for work on aircraft components includes a bank of large vertical turret lathes, sheet metal presses up to 1600-ton capacity, finishing machines, welding equipment, and extensive inspection facilities. *Hupp Aviation Co.*

For free copy circle No. 7 on postcard, p. 145

Carbide tools

A 50-page, colorful catalog describes over 700 carbide and carbide tipped tools. Complete descriptions, specifications and prices are given for each. There are sections on centers, boring bars, replacement carbide tips, diamond wheels, drills for hardened steel, flute end mills, face mills, keyseat cutters, shell end mills, side milling cutters, splitting saws, and three flute center cutting end mills. *Nelco Tool Co.*

For free copy circle No. 8 on postcard, p. 145

Pickling stainless

Heat treating and pickling of stainless steel is the subject matter of a 16-page technical data booklet. It provides operating information for annealing and handling. The publication provides physical property data and facts on heating, pickling and descaling. *Crucible Steel Co. of America.*

For free copy circle No. 9 on postcard, p. 145

Bar handler

Bar stock is stored and removed 60 pct faster than by old methods with a new materials handling device. So states a catalog sheet now available. It lists the handler's advantages and features. Illustrations show how it works. *Industrial East Co.*

For free copy circle No. 10 on postcard, p. 145

Clay products

In commemoration of its 100th anniversary, a clay products firm is making available a 26-page booklet on its history, present facilities and a peek at the future. It reviews the company's modest beginning as a one-kiln pottery; takes a sober look at its present sprawling dozen plants, machine shops, branches, laboratories, trucking division and its 15,000 dealers and retailers; and attempts to take an optimistic look at the years ahead. The booklet, though showing pride in the past, boasts of new and better products, a strong dealer organization, and an up-and-coming team of young people. This publication makes interesting reading to those both in and out of the industry. *Robinson Clay Product Co.*

For free copy circle No. 11 on postcard, p. 145





This rugged new engine has been added to the Wisconsin line to fill the horsepower gap between the Model VF4 25 hp. and the Model VG4D 36 hp. Wisconsin Engines. At the same time, the mounting base is dimensionally identical to the Models VE4 and VF4 to permit convenient replacement of the latter engines if greater power is required.

The Model VH4, which now makes its bow for the first time, is the most powerful engine of its type and size available today, in our estimation. It is an engine of basic High Torque design which gives it the important advantage of being able to deliver maximum usable *Lugging Power* that carries the load through the hard, heavy pulls. It has been designed to give you the best possible performance at all engine speeds from 1400 to 2800 rpm., even when operating under intermittent shock-loads or under constant load, continuous service. It is an exceptionally smooth-running, even-firing engine and has all the traditional heavy-duty features that characterize *all* Wisconsin Models, from 3 to 36 hp. — built for hard service at all temperatures up to 140° F.

Learn more about this new engine. Write for Bulletin S-196 for detailed data and engineering specifications. Also ask for Service Map Bulletin, Form S-198.



WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

A 6032-½

Want better Service on STAMPINGS?

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Our ability to use the best of *three* stamping techniques, each our own exclusive development, assures lowest possible cost on any quantity—one to a million or more.

1 A FEW PIECES—at Experimental or Pilot Stage

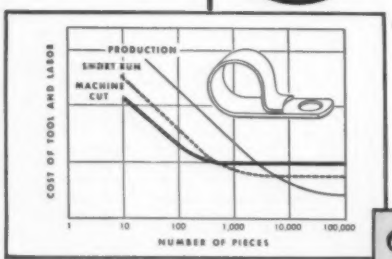
NO DIES! Our machine cut method, applying custom-built slitters, cutters, saws, files and stock punches—PLUS special techniques and skills—produce these small quantities at very low cost.

2 SHORT RUNS

TEMPORARY LOW-COST TOOLING! To produce something more than a few, but less than high production quantities, our simple contour dies—PLUS special purpose presses—keep costs low.

3 PRODUCTION RUNS

MODEST DIE CHARGES on larger quantities! Here is where our regular production tooling applies to advantage...to deliver high quantity Stampings, and at lowest possible unit cost.



You can rely on it...WE LOOK AT ALL THREE—then determine the best method for fast, efficient, low-cost service. Let us quote on your next Stampings job.

Free 12-page booklet shows how to save on stampings... write for it.

STAMPINGS DIVISION
"One Piece or a Million"
3212 Union Street, Glenbrook, Conn.

LAMINATED SHIM COMPANY, INC.

FREE TECHNICAL LITERATURE

Automatic stitchers

Automatic stitchers that speed operation of continuous processing lines are reviewed in a four-page folder. It explains how a new stitcher permits the lead end of a new coil to be joined to the trailing end of a preceding coil. This is done, it says, with a straight, tight, uniformly locked joint. Professional or skilled operators aren't needed. *Herr Equipment Corp.*

For free copy circle No. 12 on postcard, p. 145

Heat-treat furnaces

A new eight-page gate-fold catalog shows 27 heat treat furnaces. It illustrates equipment for all types of industrial heating applications, from small laboratory furnaces to large continuous brazing furnaces. *Surface Combustion Corp.*

For free copy circle No. 13 on postcard, p. 145

Welding positioners

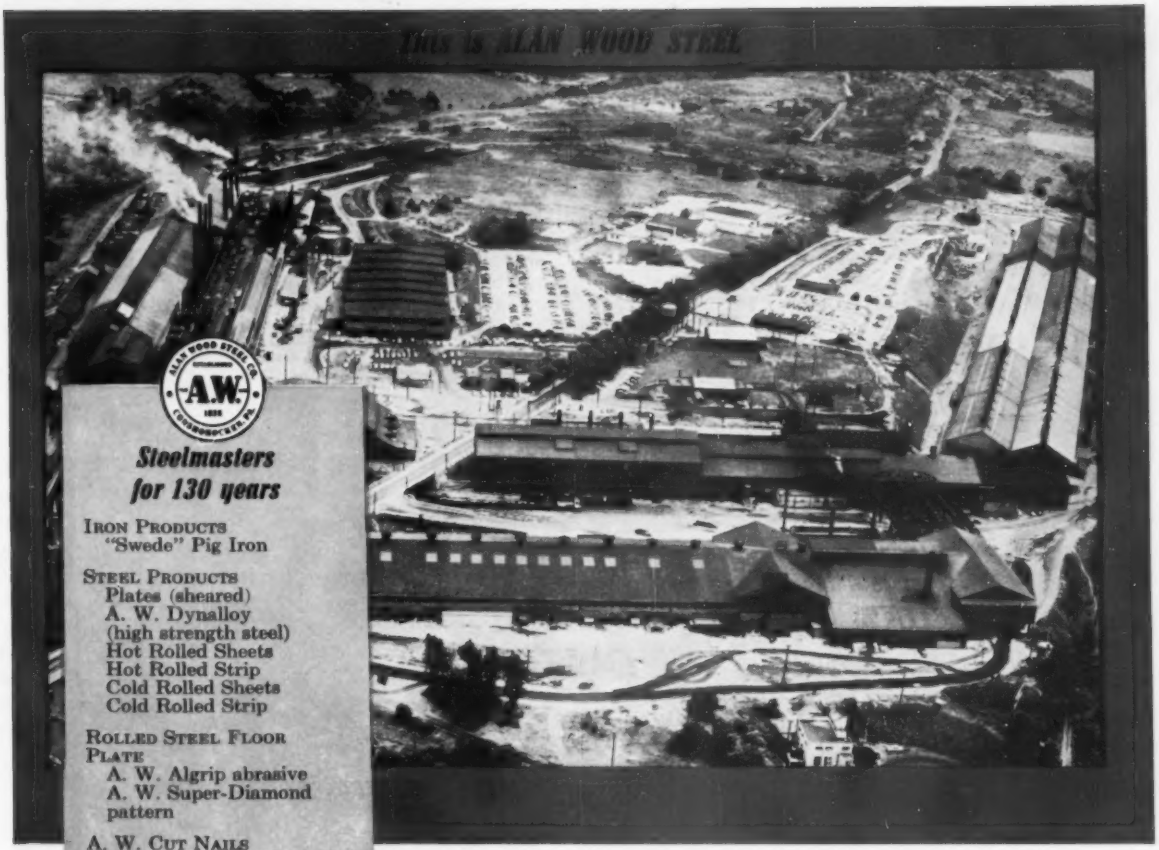
Head and tailstocks for welding and assembly are described in a new specifications sheet. It includes specifications, general description, and photographs. Designed for turning large frames and heavy structures, the distance between the headstock and tailstock can be easily adjusted. Headstocks are power-driven units with constant speed drive and remote pushbutton motor control. Tailstocks are similar in construction except they are not equipped with power drive. *Worthington Corp.*

For free copy circle No. 14 on postcard, p. 145

Rolling mills

Rolling mills and rolling mill auxiliary equipment for ferrous and non-ferrous metal are listed in a 36-page book cataloging. Covering over 25 different types of machinery, the catalog is grouped into three sections. They cover: (1) main equipment: strip mills, rod mills, special mills, gang slitters and chain draw benches, (2) auxiliary equipment for strip, rod, wire and tube mills, and (3) references tables including strip coil weight and length calculating graphs and tandem rod mill rolling schedules. *Waterbury Farrel Foundry & Machine Co.*

For free copy circle No. 15 on postcard, p. 145



Steelmasters for 130 years

IRON PRODUCTS
"Swede" Pig Iron

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Plates (sheared)
A. W. Dynalloy (high strength steel)
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Hot Rolled Strip
Cold Rolled Sheets
Cold Rolled Strip

ROLLED STEEL FLOOR PLATE
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A. W. Super-Diamond pattern

A. W. CUT NAILS
Standard & Hardened

MINE PRODUCTS
Iron Ore Concentrates
Iron Powder
Crushed Stone
Grit
Sand & Engine Sand

COKE
Foundry, Industrial & Metallurgical

COAL CHEMICALS
Ammonium Sulphate
Benzol
Toluol
Xylol
Naphthalene
Sodium Phenolate
Tar Bases (Pyridene)
Solvent Naphtha
Crude Still Residue

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$50,000,000 for Better Products

In ten years, Alan Wood Steel has expended nearly $50,000,000 for new rolling mills, furnaces, other additions and improvements to facilities, and for further development of a fully integrated operation. To our new customers and our old customers, this growth has meant new and improved products of such excellence as to reduce production and fabrication problems. Our planned expansion continues to supplement one of our greatest selling advantages—that of individualized attention to orders that Alan Wood's compact integration and flexibility make possible.

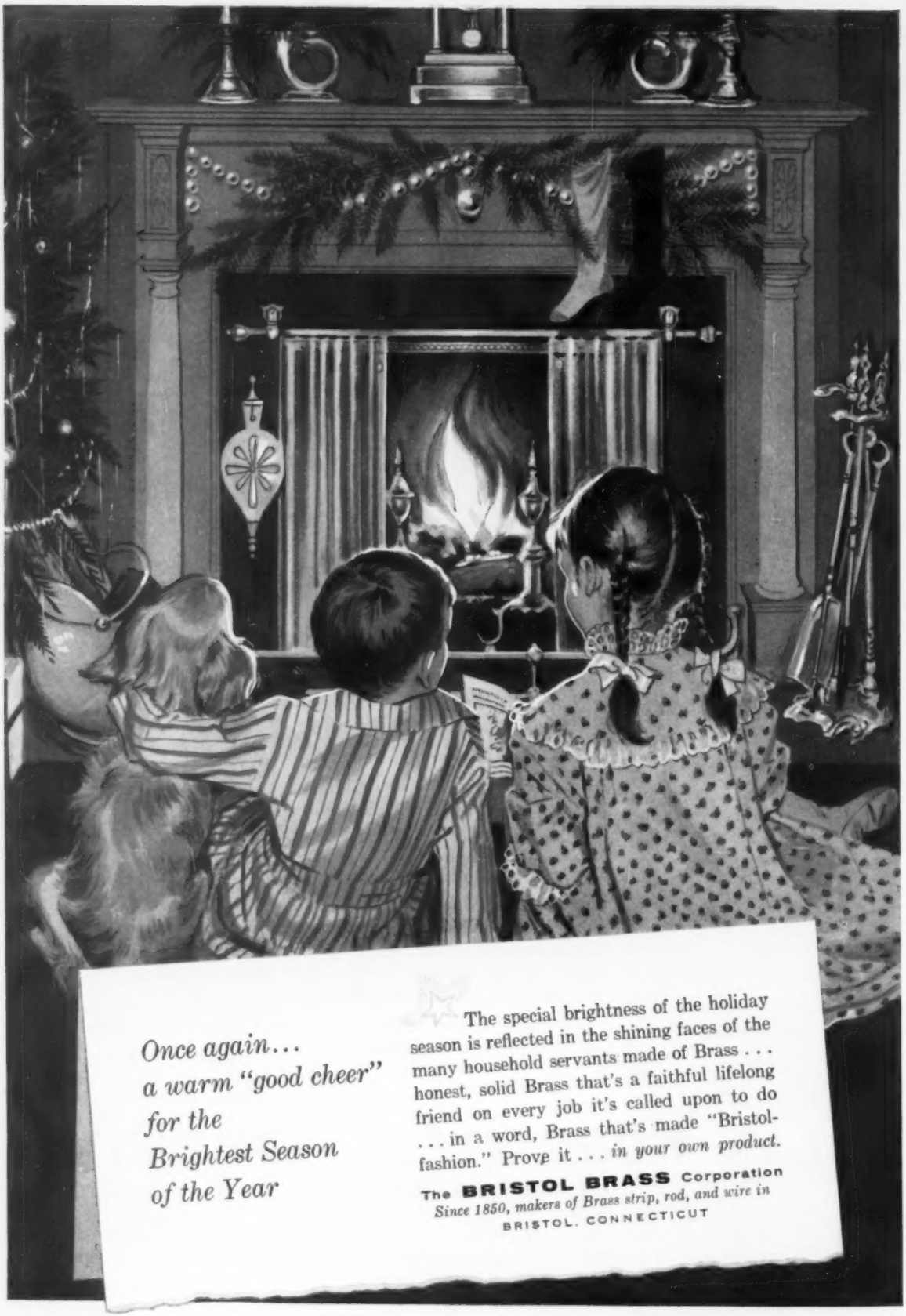
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ALAN WOOD STEEL COMPANY

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Once again...
a warm "good cheer"
for the
Brightest Season
of the Year

The special brightness of the holiday season is reflected in the shining faces of the many household servants made of Brass . . . honest, solid Brass that's a faithful lifelong friend on every job it's called upon to do . . . in a word, Brass that's made "Bristol-fashion." Prove it . . . *in your own product.*

The **BRISTOL BRASS** Corporation
Since 1850, makers of Brass strip, rod, and wire in
BRISTOL, CONNECTICUT

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 140.

Hydraulic press

Design features and specifications of a new hydraulic general purpose press are covered in a four-page brochure. It describes the down-acting press as ideal for short production runs in metal forming, straightening, coining, forging, light hobbing, general testing and die tryout. *Watson-Stillman Press Div., Farrel-Birmingham Co., Inc.*

For free copy circle No. 16 on postcard

Grinding toolsteels

Tool and die steels are grouped according to their grindability or resistance to abrasion in a new publication. It gives wheel recommendations for various operations in each class. Brand names are used in each class to identify steels most nearly similar in composition. *Bay State Abrasive Products, Inc.*

For free copy circle No. 17 on postcard

Miniature couplings

Standard and special miniature couplings for power transmission are detailed in a presently available bulletin. The four-page folder illustrates several models of miniaturized components for servomechanisms, computers and other small devices. Units are non-magnetic, lightweight, torsionally rigid and inertially low. Among advantages listed are: (1) freedom from backlash, (2) free end float, (3) smooth continuous drive with constant rotational velocity, (4) visual inspection while operating, (5) original balance for life, (6) no lubrication, and (7) no moving parts. *Thomas Flexible Coupling Co.*

For free copy circle No. 18 on postcard

Machining facilities

Manufacturing facilities available from a company for complete machines, assemblies, sub-assemblies, and machine parts are presented in a 20-page booklet. It describes a shop with 250,000 sq ft of floor space equipped to turn out a wide range of industrial machinery and parts. This company has over 60-years experience in the machine manufacturing field. Numerous photographs show the equipment and craftsmen in action. Included are introductions to the following departments: automatic screw machines, precision grinders, drilling, lathe, milling, tool room, welding, cleaning, rough grinding and polishing, heat treating and assembly. *Crown Cork & Seal Co., Inc.*

For free copy circle No. 19 on postcard

Motors

An electric motor producer is making available a 20-page condensed catalog. Prices and selection data for the more commonly used electric power drives are included. The catalog covers normal speed electric motors, geared motors, variable speed transmissions and speed reducers. *Sterling Electric Motors, Inc.*

For free copy circle No. 20 on postcard

Company profile

A metal forming producer has available a new product and facilities folder. It provides a quick, over-all picture of the company. The firm's plant, metallurgical laboratory, manufacturing facilities and its standard and aircraft products are pictured. *The Fenn Mfg. Co.*

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Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **12/5/56**

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FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

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No postage necessary if mailed in the United States

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FREE TECHNICAL LITERATURE

Vacuum processing

Recently increased performance ratings of a company's rotary mechanical vacuum pumps are contained in a completely revised 28-page catalog. It includes specifications, formula tables, constants, and conversion factors frequently used in vacuum processing. Solutions to pump selection problems for typical vacuum systems is covered. Information on continuous oil purification and maintenance procedures for high vacuum pumps is contained. *F. J. Stokes Corp.*

For free copy circle No. 22 on postcard

Stud welding

Industry standards in arc welding studs, pins and tapped pads for stud welding are the subjects of a 36-page booklet. It contains an index and reference to equipment and accessories used in stud welding. Each specification page lists size minimums and maximums. It details mechanical properties, chemistry, thread sizes, plating and annealing information and other data. *Stud Welding Div., KSM Products, Inc.*

For free copy circle No. 23 on postcard

Solvent

A non-alkaline, non-acid detergent and rust preventive cleans, degreases and rustproofs metal in one operation. A 12-page leaflet describes how the non-flammable material eliminates fire hazards; replaces expensive and less efficient soaps, alkalies and solvents; eliminates the problems of dermatitis, and skin irritations; is odorless, neutral chemically and inexpensive. *Harry Miller Corp.*

For free copy circle No. 24 on postcard

Stainless steel

"Stainless Steel for Living" offers information about stainless steel for use in the home. This four-color, 32-page booklet is intended primarily for reading by housewives. However, it might be helpful and informative for producers, suppliers and dealers of such equipment. *Allegheny Ludlum Steel Corp.*

For free copy circle No. 25 on postcard

Plating analyses

"Simple Methods for Analyzing Plating Solutions" is a new 36-page, bulletin now offered. It is prefaced by a discussion of analytical principles, use of apparatus and methods for sampling a plating solution. It then outlines steps involved in 28 analytical methods for testing nickel, copper, silver and other metalfinishing solutions. *Hanson-Van Winkle-Munning Co.*

For free copy circle No. 26 on postcard

Hook scales

Hook scales that work without friction are depicted in a four-page brochure. Accurate enough to be certified in any state, it is approved for sealing in N. Y., Calif., Mass. and Colo. Its features include: high guaranteed accuracy, lightweight, adjustable gage, sensator-type load cell, low headroom loss, high safety factor, full 360° dial, and more. *Martin-Decker Corp.*

For free copy circle No. 27 on postcard

Diecasting machine

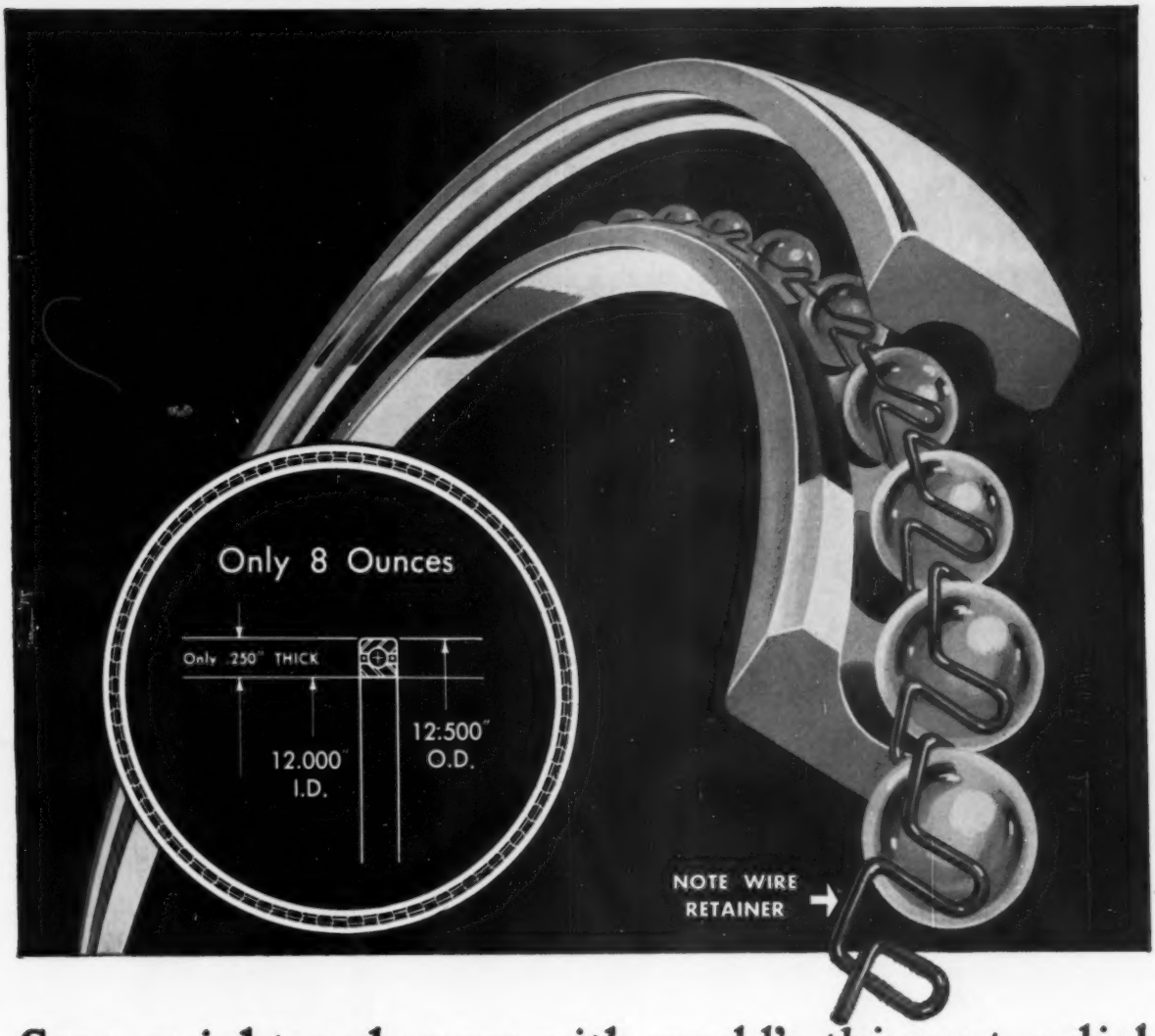
Diecasting machines, strain gage tested to 600-tons, appear in an eight-page bulletin just off the press. Photographs and text introduce both cold and hot chamber units. The cold chamber diecasters are recommended for casting aluminum, brass and magnesium alloys; the other for zinc, lead and tin alloys. Many features new to diecasting machines are shown. *Cleveland Automatic Machine Co.*

For free copy circle No. 28 on postcard

Matchplates

Pressure cast aluminum matchplates available from one company are covered in a folder presently obtainable. It explains how their engineering department assures customers of the best matchplates for producing the best possible castings. Master patterns, molding, set-up and baking, pouring matchplate, snagging, straightening and inspection, plate cleaning, cope and drag sets and aluminum coreboxes are subjects briefly covered. *Springfield Cast Products, Inc.*

For free copy circle No. 29 on postcard



Save weight and space with world's thinnest radial ball bearings—*Reali-Slim* by Kaydon

HERE it is! A *Reali-Slim* radial ball bearing with a wire separator that has just short of a full complement of balls for maximum capacity. What's more, you still get all the advantages of a separator between the balls. This design also gives you a bearing that's light-in-weight and is, without a question, the thinnest bearing ever built in this diameter.

Whatever your product design, there's a small or large diameter *Reali-Slim* bearing that can be the right answer to your thin-section bearing problems.

The radial ball bearing, illustrated here, is *really slim* — 12.000" I.D., 12.500" O.D., .250" thick . . . *and weighs only eight ounces.* It has 9,810 lbs. static load capacity, 1,256 lbs. at 100 rpm. Kaydon is able to produce *Reali-Slim,* high-precision bearings because Kaydon specializes in the unusual.

Kaydon bearing engineers are prepared to give you valuable help with technical, thin-section bearing problems.

For detailed information on Kaydon's *Reali-Slim* line, ask for engineering catalog No. 54-RS3 detailing:

Reali-Slim Ball Bearings — Conrad, angular contact and 4-point contact types in seven standard cross sections from ¼" to 1.000" and in bore diameters from 4" to 40".

Reali-Slim Roller Bearings — Radial and taper roller types in cross sections from 9/16" and in bore diameters from 5" to 40".



THE KAYDON ENGINEERING CORP.

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HOT FORMING: Bolt Heads

Fastener maker switches to carbide dies for hot heading titanium bolts . . . Production jumps from 150 to better than 2500 per hour . . . Better physical properties reported.

Switching to cemented carbide dies in hot heading titanium bolts allowed an aircraft fastener manufacturer to increase production 16 times. In addition, reports the firm, it resulted in bolts of better physical properties finished consistently to final size.

According to the company, Voi-Shan Mfg. Co., application of the carbide dies boosted production from 150 to better than 2500 bolts per hour by providing greater wear resistance and eliminating galling.

Heated To 1500°F

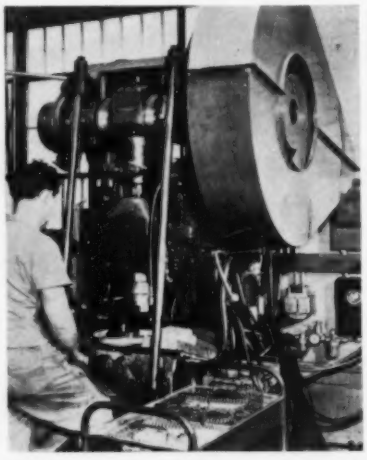
Although the company uses cold heading in upsetting its steel alloy bolts, all the titanium and some stainless steel bolts in larger sizes are hot forged. In hot heading, they use titanium of the RC130 series. The material, in form of cut-off blanks, is placed in the coil of an induction heater and heated to around 1500°F for about 3 seconds. The die itself is not normally preheated.

Temperature of the induction heater, however, is controlled carefully. Excessive temperature results in grain growth and other detrimental effects. Insufficient temperature produces incipient or open internal or surface cracking.

Semi-automatic Operation

Following heating, the blanks are inserted, one at a time, into the die of an open-head machine. The operation is almost semi-automatic. The operator trips the press to form the desired configuration and eject the bolt, while he inserts another blank in the induction heater. Both 60 and 85-ton mechanical, and 60-ton hydraulic presses are used.

Before shifting to carbide dies, the company reports, it experienced considerable difficulty with steel dies. One reason was the heat involved in the hot heading, which caused the steel dies to break down quickly, particularly on the radius at the end of the inside diameter. Another reason was a galling problem due to the affinity of titanium to steel.



This 60-ton press uses carbide dies to hot-head titanium bolts.

Today, special precision-built Carboloy grade 190 cemented carbide dies provide as many as 50,000 of the larger size bolts before any signs of wear show up. Previous dies wore after upsetting only 3000 bolts. The carbide dies perform

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 145. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

even better on smaller diameter bolts, producing as many as 100,000 as against 5000 previously. In a 100,000 run the carbide dies are removed about 10 times for re-polishing.

Voi-Shan Mfg. Co., producer of the titanium aircraft bolts, is located at Culver City, Calif. Carboloy die materials are products of General Electric's Metallurgical Products Dept. in Detroit.

Alloys:

X-ray machine probes iron-aluminum alloys.

Hitherto unknown changes in the atomic arrangement of iron-aluminium alloys have been discovered through use of a powerful crystallographic x-ray machine.

Valuable for their superior magnetic properties, iron-aluminum alloys were previously observed at certain temperatures, and found to react in unexpected ways. Researchers were aware of these changes but were unable to understand or explain them.

Sharply Reduces Time

With the use of the new high intensity x-ray machine, it is possible to take x-ray photographs of these alloys. This is done during the precise moments when, due to temperature changes, the magnetic arrangement of atoms is undergoing transformation.

X-ray time has been reduced sharply on iron-aluminum and other alloys under investigation. This unusually high power, plus the fact that the x-ray beam can be concentrated on a focal spot less than half the normal size, makes it possible to obtain an x-ray source which is 15 times more brilliant. Thus, x-ray photographs can be taken in one-fifteenth of the usual time. This collapses hours of normal work into a few minutes.

High, Low-Temp Research

Westinghouse Electric Co. research scientists, who developed the unit, say that because of its unusually brilliant x-ray source, the machine makes possible metals research that previously was con-

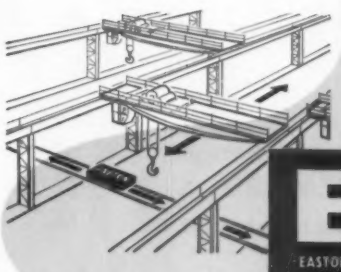
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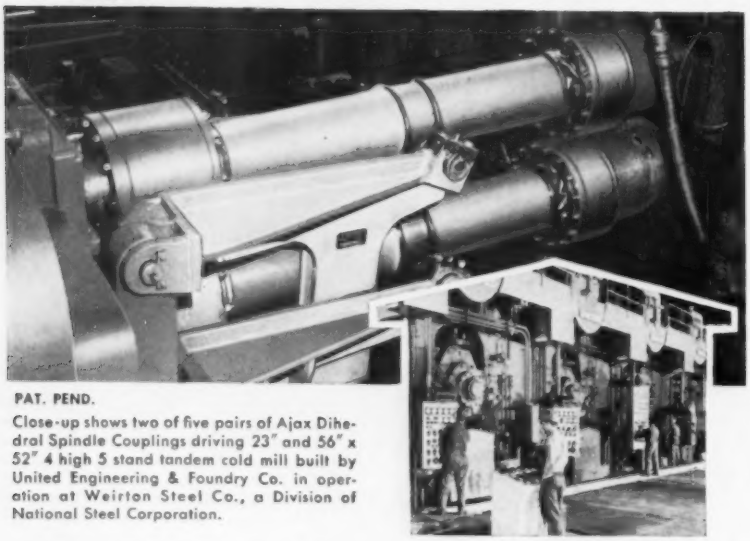
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A-1080



AJAX

DIHEDRAL SPINDLE DRIVE COUPLINGS HANDLE SPEEDS UP TO 7200 FPM



PAT. PEND.

Close-up shows two of five pairs of Ajax Dihedral Spindle Couplings driving 23" and 56" x 52" 4 high 5 stand tandem cold mill built by United Engineering & Foundry Co. in operation at Weirton Steel Co., a Division of National Steel Corporation.

● One of America's newest and most talked about mills is driven by ten Ajax Dihedral Spindle Couplings.

This 23" and 56" x 52" 4 high, 5 stand tandem cold mill is turning out sheet of high quality finish and maintaining close gauge tolerance at speeds up to 7200 fpm.

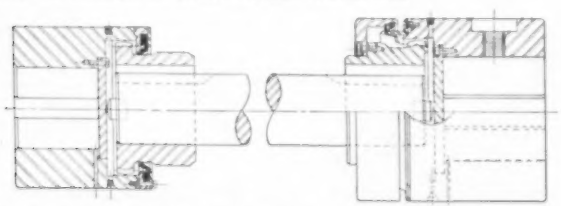
Uniform angular velocity made possible by Ajax Dihedral Spindle Couplings is an important factor in the performance of this high speed mill built by United Engineering & Foundry Co. for Weirton Steel Co., a Division of National Steel Corporation.

Each of these couplings delivers 2500 hp between drive stand and rolls.

The proven performance of Ajax Dihedral Spindle Couplings is writing new standards into the specifications of mill builders and new figures into the production and maintenance cost records of mill users.



Sketch shows 9" diameter by 5'6" overall length Ajax Dihedral Spindle Coupling. Arranged for booted lubricant retainer seal.



Showing Ajax Dihedral Spindle Coupling 6'4½" overall with 15¾" diameter coupling on roll end and 13¾" diameter coupling on drive end.

AJAX FLEXIBLE COUPLING CO. INC.
WESTFIELD, N. Y.

sidered too costly or otherwise impracticable.

This is especially true in cases where metals must be tested at high or low temperatures. The machine takes x-ray photos at temperatures as low as 300° below zero Fahrenheit. This conceivably could be accomplished with less powerful equipment. It would, however, be difficult to maintain accurate temperature control. Because of the long exposure time which would be necessary, the cost of liquid helium, the cooling agent, would be prohibitive.

Reduces Exposure Time

By reducing exposure time to one-fifteenth of that formerly required, the cost of liquid helium needed for cooling is reduced proportionately.

In addition to conducting studies at low temperatures, the Westinghouse x-ray unit has photographed metals in a super-heated state. X-ray "snap shots" of metals as hot as 3000° Fahrenheit are taken. This makes possible the study characteristics of the metal before it vaporizes or undergoes some chemical change at the elevated temperature.

Joining:

How to get best ultrasonic soldering iron results.

Ultrasonic soldering equipment provides an efficient and convenient means of soldering aluminum and its alloys. The many applications of ultrasonic soldering include fabricating or altering aluminum patterns, filling in blowholes in aluminum castings, bonding of aluminum cables, soldering electrical or electronic assemblies connections and circuits.

Metallic Oxide Forms

In soldering, it is often difficult to remove the thin layer of metallic oxide which forms naturally on the surface in air and prevents the solder reaching it. Chemical fluxes are effective in many cases but this is not the case with aluminum. If intense ultrasonic vibrations are communicated to the

Two Separate Circuits Mean

Reliable Rectifier Operation



ALLIS-CHALMERS
Mercury Arc Rectifiers

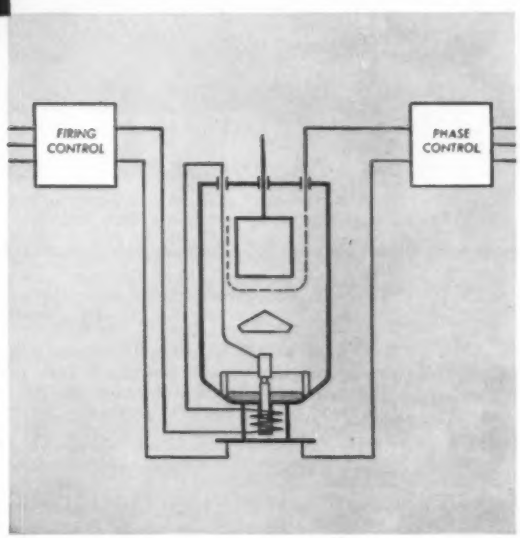
One of four metal-enclosed assemblies in a midwestern installation with a total capacity of 15,000 kw at 620 volts, dc.

1. Firing Circuit

A small dc excitation arc is automatically ignited only once, when the unit is started. It is then maintained on the mercury cathode of each rectifier tube. It offers advantages similar to a pilot light. Since it is far easier to maintain an arc than to start it, this feature reduces the chance of the excitron losing excitation during power supply disturbances.

2. Phase Control Circuit

A separate circuit utilizes the deionizing grid to obtain phase control. Grid-type phase control permits operation in the clean region near the anode where ion density is lowest, instead of on the surface of the cathode mercury pool where there is turbulence and contamination. Reliability of phase control does not depend on the condition of the mercury. This is an exclusive excitron feature.



Only Excitron Rectifiers Provide Separate Circuits

for these two all-important functions. Improved operation results — one function is never sacrificed for the other — you get optimum operation from each.

For Complete Information on rectifier operation, call your nearby A-C office, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5136

molten solder in contact with the metal, cavitation in the solder will erode away the oxide skin, allowing the solder to reach and combine with the metal surface.

Here are a few tips on ultrasonic soldering, as related by Acoustica Associates, Inc.:

Make quite certain that the area to be worked is absolutely clean. Grease is particularly detrimental. Remember that flux must not be used with this method.

Do not trap oil or grease, or anything which will give off a vapor, within the work. Make quite sure that there is sufficient molten solder on the bit. It is this which carries the ultrasonic energy to the metal being worked.

Use pre-heating on large jobs, or for speed on small ones a gas jet, hot plate or both. Remember that aluminum carries heat away faster than tin plate.

Always move the iron slowly over the area to be tinned and before joining wipe off the dross which will float to the surface, using a steel scraper or glass wool. Try to heat sheet metal evenly—aluminum may be permanently deformed by localized heating.

Cover Soldered Areas

Do not use butt joints on sheet metal unless supplementary mechanical strength is provided. Cover all soldered areas, likely to be exposed to tropical or other adverse weather conditions, with a suitable protective lacquer.

Use pure solder consisting of 90 pct tin and 10 pct zinc. Do not file the bit—the length is important—if cleanliness has been observed it should not be necessary.



Ultrasonic soldering works best in a clean area.

Ultrasonic soldering is applicable to the following metals: pure and commercial-pure aluminum; aluminum light alloys and anticorrodal alloys up to 10 pct magnesium; also for the fluxless soldering of copper, brass, and zinc; joining dissimilar metals together, e.g. brass or steel to aluminum; zinc base alloys when not subjected to humid conditions.

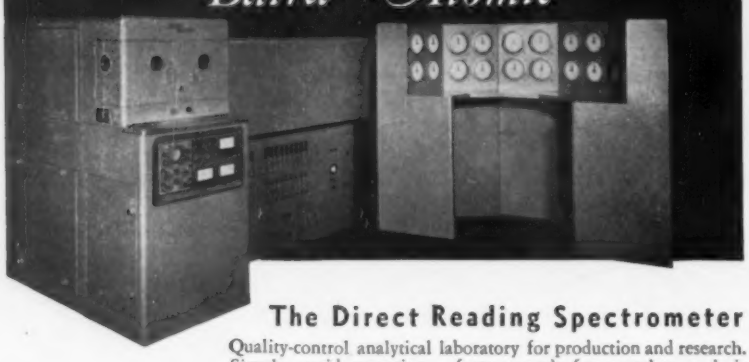
Instruments:

Device makes possible faster computer recording.

Recording of data from modern electronic computers is done many times faster with a new device than by previously used methods.

Stromberg-Carlson, its design-

SPECTROGRAPHIC EQUIPMENT for Metal Analysis by Baird—Atomic



Baird-Atomic offers a complete line of spectrographic equipment for the analysis of metals in production and fabrication.

B-A instruments provide rapid, accurate analysis . . . simple, stable operation, trouble-free economical performance.

The Direct Reading Spectrometer

Quality-control analytical laboratory for production and research. Simple, rapid operation — forty seconds for complete analysis on dials reading directly in percent concentration. Permanent optical alignment with the Automatic Servo Monitor. Other features include: unique (patented) measuring system . . . plug-in components assuring continuous operation . . . rugged design for plant operation . . . and versatile specimen holders.

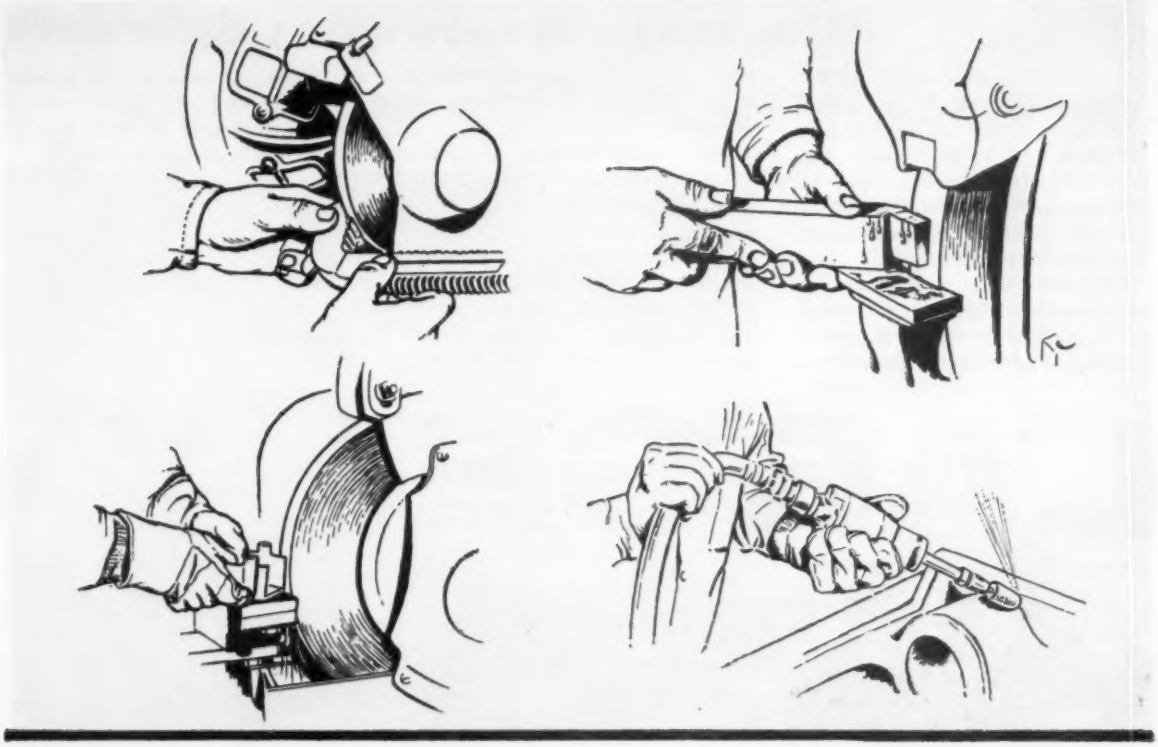
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Baird - Atomic, a pioneer in the emission spectrographic instrument industry, offers a complete line of equipment for a spectrographic laboratory. Over twenty years of experience and design are incorporated into the following components: Three-Meter Grating Spectrograph, with its 20-inch camera; Double Beam Densitometer Comparator, employing an optical null-balance system and allowing for direct density measurements on a linear scale; Calculating Board, to easily translate densitometer readings into percent concentration values; and Spectrographic Source Unit, whose versatility supplies a full choice of excitation conditions for all emission problems.

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ers and manufacturers, report that it is capable of recording data equal in amount to that in a 300-page book in 30 seconds. The first complete model has just been shipped from the firm's San Diego plant to Johns Hopkins University, Baltimore, Maryland.

The instrument can record in permanent, readable form the output from an electronic computer at speeds more than 10 times those attained by any computer readout system previously used, says the company.

The device utilizes a shaped beam tube of a 7-in. diam, a sort of "electronic typewriter." This tube reproduces letters and numbers each of which is just thirty-thousandths of an inch in height. By utilizing this tube the model can reproduce and photograph these tiny characters at the rate of 10,000 per second. The screen or face of the tube can accommodate a maximum of 6500 letters and numbers at any one time.

The tube has been called an "electronic typewriter" because it utilizes a stream of electrons, extruded through tiny metal stencils to create numbers and letters at split-second speed on a phosphor-coated screen, similar to the screen of a television set.



Engineer tips shaped beam tube into the computer readout.

The computer readout's increased speed is possible because the 7-in. shaped beam tube is smaller and reproduces smaller characters than earlier models. Thus more data can be displayed and recorded in a given space.

The face of the tube is positioned in the assembly so that the letters and numbers reproduced can be recorded by a specially designed camera on 35 millimeter film.

Testing:

Electronic setup analyzes generating system.

An electronic system analyzes the operation of a giant steam generating unit in a few hours. This ordinarily requires weeks of work by a team of specialists.

By means of "sensing" elements linked to analog scanners, the system can probe hundreds of different boiler locations. At the touch of a button, it begins gathering such data as temperature, pressure and

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This 36-page large fastener catalog contains complete dimensions, specifications and prices on Dyson large forged nuts. Dyson large nuts, bolts and blanks are forged in a modern plant devoted exclusively to large fasteners. Prompt service on special requirements. Adequate Steel Stocks, machining and heat treating facilities.



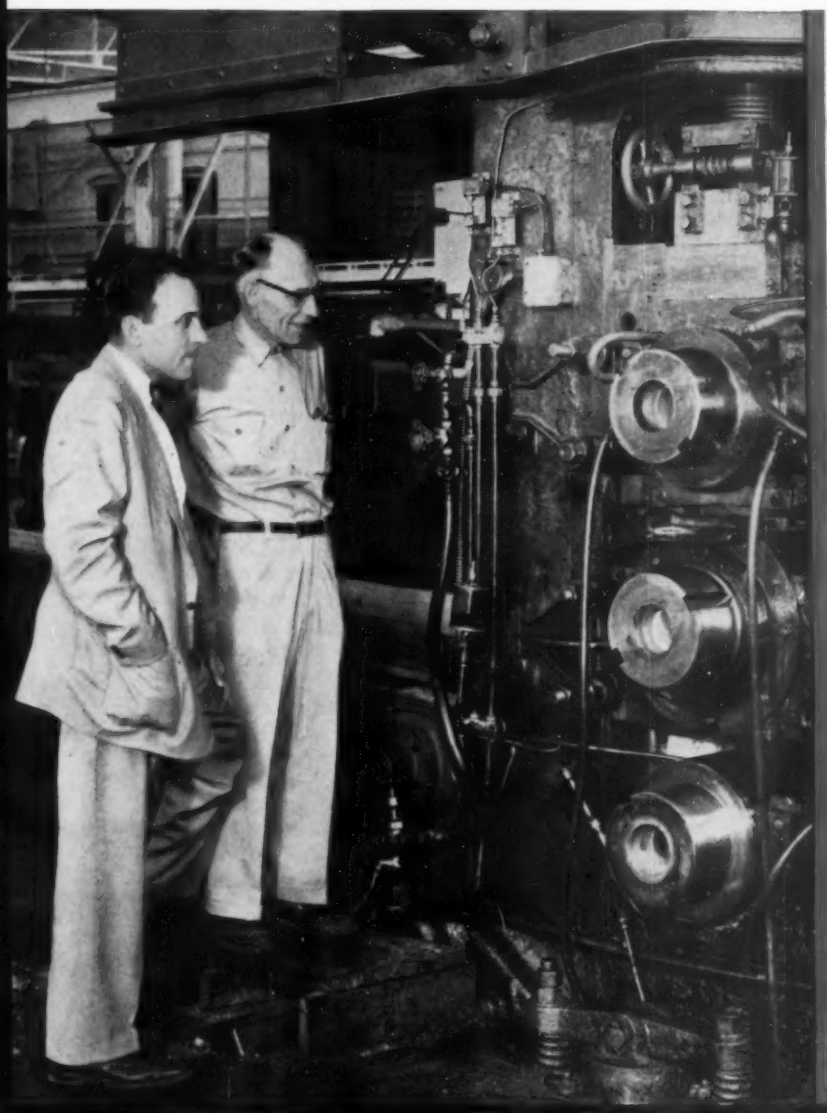


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THERE'S NO SUBSTITUTE FOR QUALITY

Sick slab roll recovers fast with application of STANOGEAR *Compound*



A slab roll at Matthiessen & Hegeler Zinc Company, La Salle, Illinois, was sick. It suffered from repeated roll neck bearing failures. Bearing temperatures couldn't be controlled. A consultant was summoned—Marshall J. Fox, Standard Oil lubrication specialist. His diagnosis and remedy: Install STANOGEAR Compound and equip the machine with a central pressure system for application. Recommendations were followed. Result: No bearing failures, due to faulty lubrication, since. Maintenance costs reduced. Time lost through breakdowns slashed.

This was a condition made to order for STANOGEAR to remedy. And Matthiessen & Hegeler knew there was a man at hand who could suggest what should be done. It's another demonstration of what this unbeatable combination can do when put to work:

1 **Standard Oil lubrication specialists capable of giving technical help.**

2 **Top quality products *that deliver results required.***

STANOGEAR Compounds contain special additives making them suitable for applications where heavy loads cause welding, seizure or scoring.

In the Midwest and Rocky Mountain states, a Standard Oil lubrication specialist in your nearby Standard Oil office will gladly give you more information about STANOGEAR. Call him. Or contact Standard Oil Company, 910 So. Michigan Avenue, Chicago 80, Ill.

Eugene Ewald (right), Mill Foreman, and Marshall Fox, Standard Oil lubrication specialist, inspect slab roll. STANOGEAR Compound helped solve lubrication problem on roll neck bearings.

Marshall Fox who proposed switch to STANOGEAR with resultant improved operation, is experienced in providing such technical service. Marsh has a Mechanical Engineering degree from Purdue to qualify him for this work. In addition, he has completed Standard's course for sales engineers. This experience and training, customers find, pay off *for them.*

STANDARD

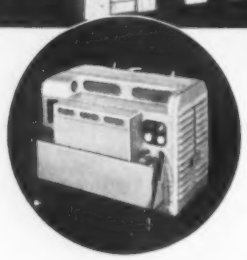
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Power That's Interchangeable from Truck to Truck	YES	yes	no
Power That Lasts for the Life of the Truck	YES	no	yes





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Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

gas composition. Electronic devices, without human guidance, then sort the information. They supplement it with pre-set figures, and punch it in code on continuous tape.

Tape readings are transmitted by teletype to New York City, where Babcock & Wilcox Co., one of its developers, has a large electronic computer. Translated automatically into code suitable for computer use, the information is processed mathematically and transmitted back to the boiler site for application by engineers and technicians.

Helps Answer Problems

The new system has been developed to help engineers determine quickly and economically such boiler problems as sources of heat losses, the most efficient types of fuels, and when and where to remove combustion waste deposits.

The setup's "brain" is a centrally located electronic coordinating unit at Alliance, O. A special "scanning" device created by The Bailey Meter Co. of Cleveland, makes it possible for the system to gather data from widespread points of a boiler. Each scanning unit collects information from 25 different sensing elements. Any number of these devices may be hooked up with the system, depending on the quantity and location of points from which information is desired.

Inspection:

Firm checks equipment on 32-ton surface plate.

McKiernan-Terry Corp., Dover, N. J., checks preciseness of radar pedestals on a 32-ton granite surface plate. The block of granite measures 12 x 12 ft and is 2½-ft thick. Optical instruments are unable to detect any variation in flatness in the central working area. At the outside edges it deviates from perfect flatness by only 0.0002-inches.

Surface Cleans Easily

Granite was chosen for this application because it provides a smooth, non-raised surface despite small chips or holes resulting from

continued use. Specified accuracy over the entire plate surface is thus assured for a number of years without refinishing. In addition, the granite is not abrasive to test instruments or the equipment being tested on its surface, and it is nonmagnetic. Being rustproof, the surface can be cleaned easily with water and any commercial detergent.



Parked sportscar dramatically illustrates plate's size.

The plate was manufactured by Jones Brothers Co., Barre, Vt. It was shipped from Vermont by low-boy truck and, because of the traffic hazards caused by its dimensions, required a police escort.

Handling:

Hoisting equipment joins the automation field.

Monorail electric hoists with motor driven trolleys are the latest handling equipment to join the automation picture. Yale & Towne Mfg. Co., Philadelphia, is presently making available automatic duty cycle hoists that combine to form flexible, continuous processing systems.

One of the new Yale systems is in operation at Gillette Safety Razor Co. in Boston. This serves a processing cycle for plating small razor parts.

The razor manufacturer wanted a faster, more compact and more flexible system than the old rack plating process. In addition, Gillette wanted manual handling and lifting kept to a minimum.

The solution was found in arranging processing and plating tanks in a long, oval pattern. Handling is done with six electric hoists with motor driven trolleys mounted on a closed loop track above the tanks.

Occupies Less Space

Installation of the system provides more output in less space with less manpower than a conveyorized rack plating system. It permits changes in cycle length for all segments of the process by the adjustment of control circuits and timers.

The only manual handling operations are at the beginning and end. Initially, parts are dumped into large perforated, plastic barrels. These are suspended from the hoists by special nonconductive load bars. At the end, barrels are dumped into a hopper. This in turn, automatically dumps them into a dryer. From the dryer,



Dake Gap Type Press broaches boring bars

How to Straighten Flap Tracks

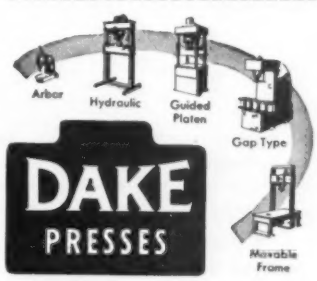
Precision parts for aircraft call for the use of precision equipment.

These flap tracks, machined from 4130 steel (aircraft quality), must be checked on a straightening press four times during fabrication. For ease of control and accuracy, the work is done on Dake Gap Type Presses like that shown in the photograph above.

To the right of the ram, the operator has placed a rule gauge which indicates ram travel. Knowing the elasticity of the piece being tested, he can estimate the overtravel necessary to straighten the piece with a single movement of the ram.

Dake Gap Type Presses are available for straightening or forcing, in 22 models ranging up to 300 tons capacity. They are fully described in Bulletin No. 299—sent on request.

Dake Corporation 602 Seventh St., Grand Haven, Mich.



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parts are returned to their original trays ready for inspection and assembly.

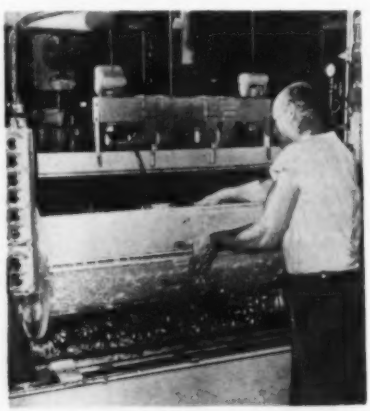
The plating operation is divided into four phases, three of which consist of several operations.

In the first phase the actions of the hoist, raising and lowering the load and travel from tank to tank, are controlled by the operator. This is done from the hoist pendant push button control station. When he lowers a load into a tank the lower limit switch actuates a remote timer which is preset to any desired time from 3 seconds to 20 minutes.

Wheel Turns Constantly

Each of the tanks in the system is fitted with a constantly turning gear wheel which engages a gear on the barrel, rotating the load in the solution in the tank.

Following completion, the load is cycled through the next series of tanks automatically. There are two sequences possible depending on the parts processed. The operator sets a selector switch on the pendant control. Then the hoist starts into one of the two cycles: (1) load is raised until it hits the upper limit switch, (2) motor driven trolley moves it over the first tank where its movement is



Operator dumps finished, plated parts on hopper for drying.

stopped by a travel limit switch, (3) load lowers into tank where lower limit switch actuates a preset timer, and (4) at the end of the proper time it is raised and continues to the next tank.



SERVICE-SCORE STICKERS provide valuable wire rope facts

...to test performance, speed reordering

For efficient wire rope operation you must have wire rope facts—brief, handy, accurate facts. You need them for safety (when did that line go on?). You need them for reordering (what size is the hoist line?). And you need them most of all for figuring cost (how long did it last?).

But gathering wire rope facts can be time-consuming—unless you have an easy, simple system.

Leschen's Service-Score Stickers provide such a system. The facts are always at hand—on the machine while the wire rope is working, and in the record book from then on.

Service-Score Stickers make it easy to compare the service you get from various rope constructions, types, and brands, so you *know which one is best* for you.

With the Service-Score System you prove to yourself that Red-Strand wire rope consistently exceeds industry standards for strength and safety.

Write for your starting supply of Service-Score Stickers now —or see your Leschen distributor.

LESCHEN Red-Strand WIRE ROPE — A DIVISION OF HKP H. K. PORTER COMPANY, INC.

Keep the score and you'll use it more Red-Strand Wire Rope

LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri

Certain tanks are bypassed automatically depending upon the cycle desired.

Plating Takes Longest

The plating stations require the longest single time in the whole system. Loads are moved into one of the stations from the previous phase by manual control of the push buttons and the hoist is disconnected from the barrel after the load has been placed so that it can be utilized to move ahead in the system to pick up a load ready to come out of plating.

When the plating is completed the operator moves a hoist over the tank. He picks up the barrel and sets the "automatic" button on the push button station. This starts the parts through a final automatic cycle consisting of seven tanks, each of which requires a different immersion time.

Foundry:

Frozen mercury process reduces machining.

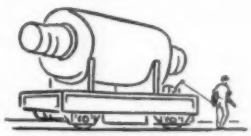
Three expensive machined parts were formerly required to get the necessary internal cavities for a valve body. Its use on an electronic tube evacutator made special tolerances necessary. After assembly by welding, re-machining and testing, a large part of the total production was rejected. The parts manufacturer, Consolidated Vacuum Corp., indeed had a problem.

The company called on Alloy Precision Castings Co., Cleveland, for advice. Their foundry engineers and metallurgists recommended use of a process called "mercasting." This is a frozen mercury method of investment casting. It makes available one-piece shapes sometimes difficult to cast or machine.

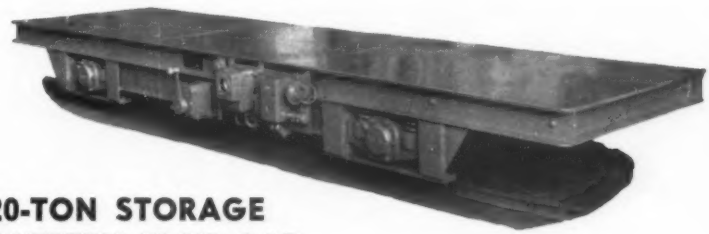
Holds Close Tolerance

The solution to the valve body part problem was development of a one-piece, 5½-lb mercasting of 303 stainless. The "as-cast" piece is held to a ± 0.003-in. per inch tolerance on certain critical dimensions. A small amount of fin-

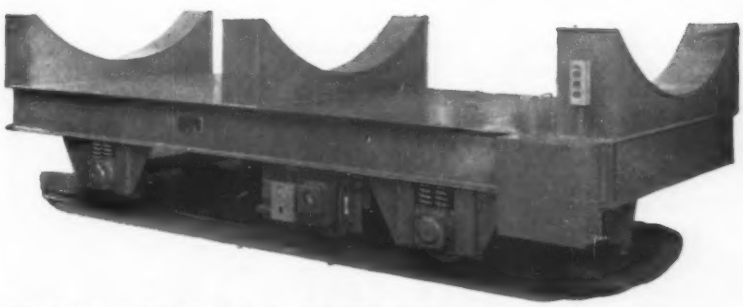
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126 Sidney Street, Cambridge 39 Massachusetts

ish machining is all that's needed now on valve seats and tapped holes.

In manufacturing investment castings by the Mercast Process, a mercury pattern is made by pouring liquid mercury into a freezing mold. This is then immersed in a freezing bath. The mercury pattern is coated with a



Pneumatic hammer "knocks" casting out of its mold.

ceramic slurry to build up a ceramic shell mold about ⅛-in. thick. The mercury can then be extracted by allowing the entire assembly to come to room temperature and pouring off the mercury.

Fire Mold At 1850°F

The shell mold is fired at a temperature of about 1850°F for two hours. Thereafter, the casting is completed by pouring the casting alloy into the ceramic molds.

The use of frozen mercury has several advantages. Complex shapes can be formed quite simply. This is due to the "self-welding" property of frozen mercury patterns. When touched with slight pressure, the patterns turn into a solid piece.

Close dimensional tolerances and less difficulty encountered in filling sections of varying thicknesses are reported. Smooth surfaces result in improved electrical characteristics, and resistance to heat, corrosion and wear.

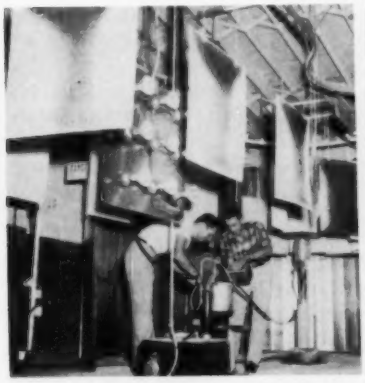
Mass production can be obtained in mercasting hard-to-machine metals including: pure nickel, Hastealloy B, Rexalloy 108, stainless, Stellite and others, both ferrous and nonferrous.

Finishing:

Electrostatic spray unit aiding porcelain development.

Installation of a complete disk atomizing type electrostatic spraying system is aiding in the developments of porcelain enamels at the Pemco Corp., Baltimore, Md.

The equipment, reports its user, eliminates much of the testing heretofore necessary in plants of customers who use electrostatic spraying on their production lines. Porcelain enamels applied by this system do not behave the same as when applied by conventional hand spraying or automatic spraying operations.



Operators fill spray tank on the disk spraying system.

Advantages reported for electrostatic spraying over hand and conventional automatic spraying include: reduced loss of spray material, even coverage, reduction of coating thickness and less spoilage.

Controls:

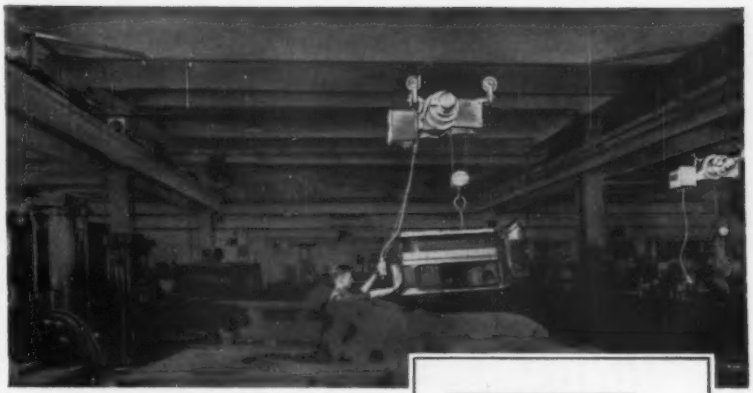
Static switching controls tandem cold mill.

Static switching is aiding various low power switching operations at Youngstown Sheet & Tube Co., Indiana Harbor, Ind. The completely static system has been installed on a four-stand tandem cold mill.

It makes available to steel industry engineers a new automation tool in the form of seven

SHEPARD NILES HOISTS

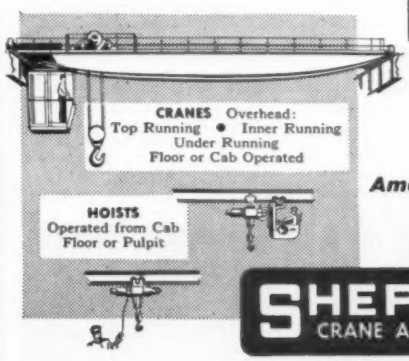
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It's a 7 ton 18-8 Casting designed to handle acidulous water

DURALOY

With our battery of large electric furnaces and our large modern well equipped molding department, castings of this size are quite common in our production schedule.

Yet, if you require it, we can produce castings as light as only a few ounces. In fact, with our shell molding department we can produce in quantity very small pieces of any high alloy analysis desired.

Experience? Well, our work with static high alloy castings goes back to 1922 and with centrifugal castings back to 1931. This long experience is your assurance of a sound casting correctly alloyed.

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basic static control elements for use in tailor-making completely-automatic control systems for a variety of applications. One of the seven elements, a multi-purpose unit, has a permanent memory function even on loss of power. It can serve 15 basic control functions.

General Electric Co., who supplied Youngstown's unit, has also developed a transistor switch. This allows circuit design engineers to combine the static switching system with the already-existing static regulating system; a co-ordinated over-all static control system results.

The new transistor switch has the ability to establish and interrupt circuit continuity while retaining circuit isolation from switching unit power supply.

Brazing:

Brazing alloys resist high temperatures, corrosion.

Four new high-nickel content brazing alloys offer high strength at elevated temperatures and resistance to corrosion and oxidation. The alloys are particularly useful for brazing austenitic stainless steel, high-nickel heat-resistant and precipitation-hardening alloys. They will also braze carbon steel and nonferrous metals having melting points above 1850°F.

The four high-nickel alloys have nickel contents ranging from 72.5° to 93.25 pct, silicon between 3.50 and 5.00 pct, and boron between 1.90 and 3.50 pct. Their designations as Hi-Temp 93, 91, 82 and 72 are based on their approximate nickel content. The alloys numbered 82 and 72 have in addition a chromium content of 7.00 and 15.00 pct respectively. All are available as cast rod, powder, resin-bonded sheet, as well as in forms fabricated and sintered from the powder.

Alloys Are Self-Fluxing

The alloys developed by Handy & Harman, New York City, are self-fluxing when used in a controlled atmosphere of dry hydrogen, argon or helium. They can also be brazed in atmospheres of exothermic or

endothermic gases and in air with the addition of flux. Standard brazing furnaces and salt baths operating at about 2150°F may be used for brazing. Cleaning and brazing procedures are generally similar to those for silver filler metals.

Tensiles To 95,000-psi

Properly designed joints will have tensile strengths of 75,000 to 95,000 psi depending on the atmosphere used, joint clearance and the composition of the brazing alloy. The mechanical properties, corrosion resistance and oxidation resistance of these alloys closely approximate those of stainless steel and heat resistant alloys.

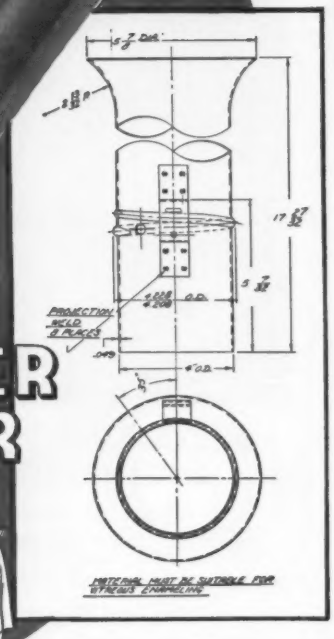
New Books:

"Machine Tool Leasing," by J. L. Treynor and R. F. Vancil, deals with machine tool leasing's history, background and growth. After a discussion of leasing's advantages, both claimed and real, it proceeds to the major question of cost considerations. A chapter even covers income-tax factors. Sixteen different leasing plans are examined. The book attempts to familiarize the reader with various pros and cons so that he may determine whether buying or leasing has the cost advantage for any given set of circumstances. 147 pp. 16 tables. $15.00 per copy. Management Analysis Center, Inc., 275 Newbury St., Boston 16, Mass.

"Phase Diagrams in Metallurgy," by Frederick N. Rhines. The importance of phase diagrams to the metallugist seems to increase in proportion with the demands made for new and improved materials. There was a time when phase studies were considered wholly academic. This is no longer the case, as Dr. Rhines' book makes abundantly clear. Starting with unary systems, he treats in order those systems which are increasingly complex. The book concludes with chapters on complex ternary systems, multicomponent systems and an enlightening discussion of the techniques used in defining phase diagrams. All-in-all, the subject

Michigan
Electric Resistance
WELDED
STEEL
TUBING
Always makes possible Better products at lower Cost

CONDENSER
TUBE
for
WASHER
-DRYER





ROUND
¼" to 4" O.D. 7 to 22 gauge

SQUARE	Gauge	RECTANGULAR
½" to ¾"	16 thru 22	
¾" to 1"	11 thru 22	½" minimum
1" to 2"	11 thru 20	side to 5"
2" to 3"	11 thru 18	maximum side

Carbon 1010 to 1025

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has uniform strength, weight, ductility, I.D. and O.D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

A [illegible]ant component of a new combination washer-dryer now on the market is this condenser tube fabricated by Michigan.

In the manufacture of this important tubular part, which helped make possible a major forward step in the development of an appliance for better living, Michigan engineers were required to solve a difficult production problem. The utmost design skill and fabrication accuracy were essential.

Refer to the drawing and note the expansion required for this part and the spiral bead—operations commonly and efficiently performed with Michigan's modern fabricating equipment. The bracket is projection welded to the tube in a single high production operation—another typical example why Michigan engineers and production workers cannot be excelled in the quantity manufacture of intricate tubular products at low cost.

Always consult Michigan first on any special tubular job requiring the greatest accuracy of product and economy of manufacture.

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matter and its treatment are basic for metallurgical scientists. 340 pp. $12.00 per copy. McGraw-Hill Book Co., 330 W. 42nd St., New York 35.

"Scientific Inventory Control," by W. E. Welch explains mathematical inventory control to the man who must do the job himself. It isn't a textbook or a theoretical study. Instead, it gets into the inventory problem's heart: how much to make or buy; when to buy it. Business mathematics can answer these questions, it relates, but the handbook is not written for mathematicians. Tables and figures patiently explain the formula; a table of square roots is included. Throughout, the author, who is procurement director of Minneapolis - Honeywell's Aeronautical Div., stresses simplification. A knowledge of arithmetic is all that's needed to apply the data. It is not oversimplified, however, and should make interesting reading for even the most mathematically minded. 168 pp. 86 tables, charts. $12.50 per copy. Management Publishing Corp., 22 W. Putnam Ave., Greenwich, Conn.

"Automatic Technology and Its Implications." In presenting this bibliography the Department of Labor's Bureau of Labor Statistics seeks to enable research workers to make use of the growing volume of published material concerning the progress of automatic technology and its social and economic effects. 78 pp. Catalog No. L 2.3:-1198 45 cents per copy. Supt. of Documents, Govt. Printing Office, Washington 25, D. C.

"Man-Hours Per Unit of Output in The Basic Steel Industry, 1939-55," contains information in trends in productivity in the blast furnaces, steel works and rolling mills industries during the years 1939-55. 40 pp. Catalog No. L 2.3:1200 30 cents per copy. Supt. of Documents, Gvt. Printing Office, Washington 25, D. C.

"Dictionary for the Iron and Steel Industry," is a double-barrelled wörterbuch, giving meanings

in both German and English. It includes the industry's current language and technical terms. The dictionary not only lists the correct equivalent in the other language but also indicates the frame of reference for the term or gives examples of its use. 342 pp., double-column. $6.65 per copy. Springer Publishing Co., Inc., 44 E. 23rd St., New York 10.

"Nuclear Metallurgy," explores the effects of irradition of metals in atomic reactors. Three authors present technical articles on: (1) Theory and Mechanism of Radiation Effects in Metals, (2) Irradition Effects in Physical Metallurgical Processes, and (3) Irradition Effects in Reactor Materials. The authors are: G. H. Vineyard, Brookhaven National Laboratory; D. E. Thomas, Westinghouse Electric Corp.; and D. S. Billington, Oak Ridge National Laboratory. $3.75 per copy. 54 pages. American Institute of Mining, Metallurgical & Petroleum Engineers, Inc., 29 W. 39th St., New York 18.

"How To Do It," is the title of a newly revised industrial photography handbook. The title best describes its content. It contains three other booklets on slides and filmstrip production, organization and operation of photo service departments, and industrial service pictures. $4.00 per copy. (Each booklet may be obtained separate for 50-cents). Eastman Kodak Co., Rochester 4, N. Y.

"Mechanical Engineering Practice," (fifth edition) is a laboratory reference text for students and practicing engineers. It is authored by C. F. Shoop, University of Minnesota Emeritus Prof., and G. L. Tuve, M. E. Prof., Case Institute of Technology. All chapters are updated to include current material. Electronic instruments, automatic controls and recently developed measurement systems are covered. The book calls attention to standards and codes of various professional groups. 471 pp. $7.00 per copy. McGraw-Hill Book Co., 330 W. 42nd St., New York 36.



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NONFERROUS: Aluminum Foil on Asbestos

Aluminized asbestos cloth material reflects over 90 pct of radiant heat . . . Worn as a suit, men enter roaring 2500°F propane fires, change ingot reheating furnace doors while operating at 2100°F . . . Sparks and cinders fall off harmlessly.

Aluminized asbestos cloth which reflects over 90 pct of radiant heat is finding uses as fire protection wear, fire baffles, welding booth curtains and the like.

Safety garments of the material make it possible for the wearer to withstand temperatures in excess of 2500°F without discomfort or ill-effect.

Comfortable At 2100°F

Field tests in steel mills show that the "cloth" makes it possible to change ingot reheating furnace doors while operating at 2100°F. Moreover, only one meter is now necessary on the electric furnace the full ten minutes of the slagging-off period. Previously a man had to be relieved every two minutes.

A utility company tested one garment by having a man walk through a 2500°F propane fire in order to extinguish it. He accomplished the job without difficulty.

Manufactured by Keasbey & Mattison Co., Ambler, Pa., the material is a tightly woven asbestos cloth surfaced with a heat protective aluminum foil. The foil's smooth surface reflects 90 pct of the radiant heat. Flying sparks and cinders fall right off without damaging the material. It resists water, oils, and, to all practical purposes, has the same corrosion-resistant qualities as the aluminum with which it is covered.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 145. Just indicate the page on which it appears. Be sure to note exactly the information wanted.



While heat bounces-off, man calmly walks through flames.

Finishing:

Powder zinc barrel brightener cuts costs.

A new zinc barrel brightener addition agent reportedly provides a uniform lustrous deposit at low cost. Available as a powder, it is said to provide an excellent luster directly from the zinc barrels. While the finish may tend toward a

ARMSTRONG *Drop Forged* **LATHE DOGS**



ARMSTRONG Lathe Dogs give extra service because they are drop forged from selected open hearth steel, and are heat treated to extreme toughness and stiffness. Hubs are made large enough to permit re-tapping, screws are also of special analysis steel and are hardened at the point to prevent upsetting. ARMSTRONG Dogs come in 10 types with square head or safety headless screws, with straight or bent tails. They are carried in stock by your local ARMSTRONG Distributor.

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5209 West Armstrong Ave., Chicago 30, Ill.
New York and San Francisco

slight yellow cast, ½ pct nitric acid or an Iridite dip produces a clear-bright finish. The particular advantages of the brightener lie in its low cost per pound and its low rate of consumption and stability.

Field testing of the material by Allied Research Products, Inc., Baltimore, Md., indicate that it cuts cost up to one-half in some cases.

Metallurgy:

Zinc-base alloy spectographic standard samples available.

Six new spectrographic standard samples of zinc-base alloys are now available from the National Bureau of Standards. Carefully analyzed and certified as to composition, the new standards are designed for calibrating and checking spectrochemical methods in the analysis of two important zinc-base die-casting alloys (ASTM designations AG40A and AC41A).

Issue Six Standards

For each of the two alloys, three standards have been issued to provide the necessary composition ranges for the elements covered by specifications; namely, aluminum, copper, magnesium, iron, lead, cadmium, and tin. The standards also contain useful concentration ranges for chromium, manganese, nickel, and silicon.

The zinc-base standards may be obtained for a fee of $8.00 each. A provisional certificate supplied with the standards gives average values of the analyses reported by the cooperating laboratories.

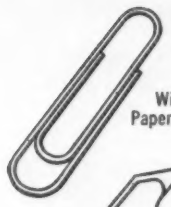
Metallizing:

Anti-friction metal powder rebuilds crankshafts.

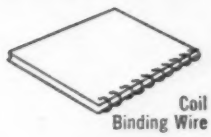
Developed specifically for rebuilding engine and compressor crankshafts by the metallizing process, a new metal powder is now available from Wall Colmonoy Corp., Detroit, Mich.

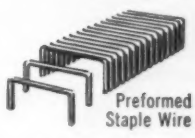
The new material is a high chromium-nickel powder containing chromium borides. It features

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Piano Covering Wire


Coil Binding Wire


Preformed Staple Wire


Wire for Milk Bottle Carriers


Florist Wire


Wire Bales for Buckets, Pails, etc.


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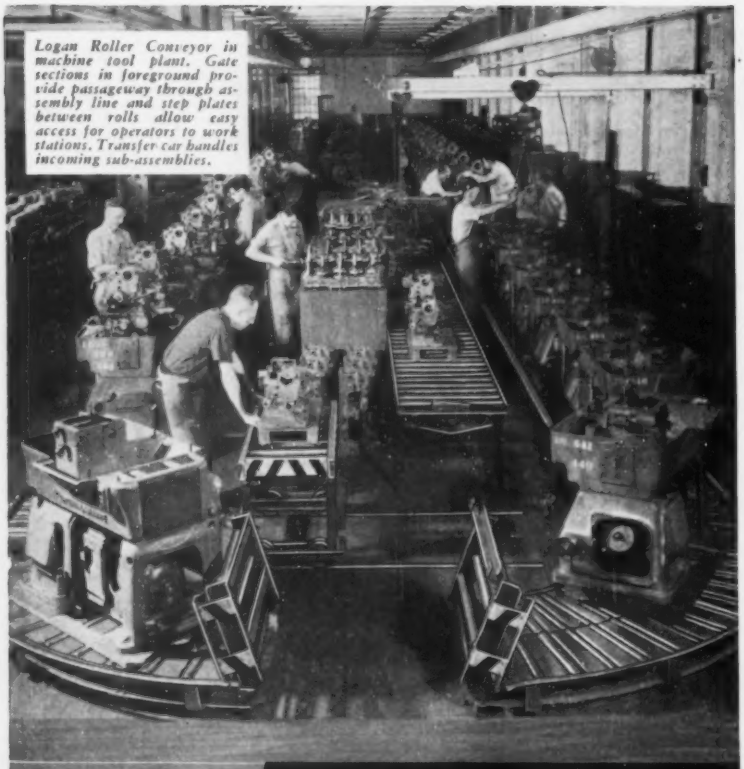
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PRODUCERS OF: Manufacturer's Wire in many sizes, shapes, tempers, and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special wire. ALSO Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.



Logan Roller Conveyor in machine tool plant. Gate sections in foreground provide passageway through assembly line and step plates between rolls allow easy access for operators to work stations. Transfer car handles incoming sub-assemblies.



The LEADERS use Logan

Small business today . . . large business tomorrow. In this country we don't have to "stay put." Development and growth are characteristics of American industrial leaders. An important factor is the insistence on highly efficient material handling methods. Take Logan Conveyors. The nation's foremost industries use this equipment to step up production tempo, enlarge capacity, improve deliveries, conserve manpower. These are Logan functions which you, too, can use profitably. Write for nearest engineer or for further information.

LOGAN CO., 545 CABEL ST., LOUISVILLE 6, KY.

Logan Conveyors

low coefficient of friction, controlled surface porosity and good oil retention properties.

The powder is recommended for: (1) reclamation of worn or scored crankshafts, (2) modification of crankshafts used in race cars and high performance stock cars, (3) sports car crankshafts, (4) salvage of crankshafts used in high performance marine engines, and (6) compressor crankshafts of all kinds.



Spraying a crankshaft journal with the new powder.

Results of a test installation made indicate relative effectiveness of the new powder. A GMC "360" truck engine with a crankshaft having main and connecting rod journals metallized was operated for 100,000 miles pulling a payload of 25 tons.

When the pan was dropped for inspection, the crankshaft and bearings were found to have retained nearly original dimensions. The amount of wear was slight enough to permit continued use of all components without replacement.

Metals:

Vinyl-coated metal features colors.

A new, vinyl-coated metal combines colors and textures in a rugged plastic finish.

Sun Steel Co., Chicago, offers the steel and aluminum in attractively textured and colored finishes. Available in 18 through 30 gage thicknesses, the material is extremely tough and abrasion resistant.

Save by using specialized refractories

Many refractories problems in metal-working furnaces have been solved *economically* by the use of B&W specialized refractory castables. Each ferrous or non-ferrous furnace application requires a specific combination of properties to meet the service conditions. Whether your problem is high temperatures, abrasion and erosion, slag attack or the need for insulation, to name a few, you will find the refractory castable best suited to your requirements in B&W's line. Shown here in digest form are data on the widely used B&W refractory castables for metal-working furnaces:

B&W Refractory Castables for Metal Working Furnaces

	Temp. F	PROPERTIES	TYPICAL APPLICATIONS
B&W Kaocast	3000	High resistance to spalling and slag attack. Low volume change and negligible reheat shrinkage.	Soaking pit covers, linings of high temperature heating and forging furnaces, burner blocks, electrode linings of electric furnace roofs, linings of non-ferrous metal furnaces.
B&W Kaocrete 32	3200	High strength, exceptional refractoriness, unusual volume stability, excellent resistance to spalling.	Can be used in applications similar to those of B&W Kaocast and where higher refractoriness is required.
B&W Kaocrete D	2500	Sufficient strength and hardness to withstand abrasion, considerable physical abuse and erosion.	Aluminum melting furnaces, linings and car tops in heat treating furnaces, as well as in sections of a wide variety of furnaces that are subject to scraping by hand tools or other mechanical abuse.
B&W Kaocrete A	2600	Resists reducing atmospheres. Has good resistance to erosion, abrasion and thermal shock.	Annealing furnace bases and other applications where resistance to reducing atmospheres is essential. Also as a general purpose castable for linings in medium temperature service.
B&W Kaocrete B	2300	Has an adhesive plastic texture particularly suited for vertical or overhanging constructions. Excellent for plastering.	Patching linings and baffles and for any application where plastering rather than gunning or casting is required.
B&W Kaocrete LI	2700	High alumina content, exceptionally high strength for resistance to abrasion and erosion.	Aluminum furnace linings where high alumina content is important.
B&W Kaolite 20	2000	Offers castable's fast, low cost installation plus insulation. Has refractoriness, light weight and low heat conductivity and, in addition, will resist reducing atmospheres. Can be poured or gunned.	Aluminum melting, heating and heat-treating, annealing and forge furnaces. Also for general maintenance and patching.
B&W Kaolite 22	2200	Has the same properties as B&W Kaolite 20. Can be used for higher temperatures but not in reducing atmospheres.	

Send for your copy of B&W Bulletin R-35. It gives additional information on B&W's versatile refractory castables.

B&W REFRACTORIES PRODUCTS: B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars • B&W Silicon Carbide

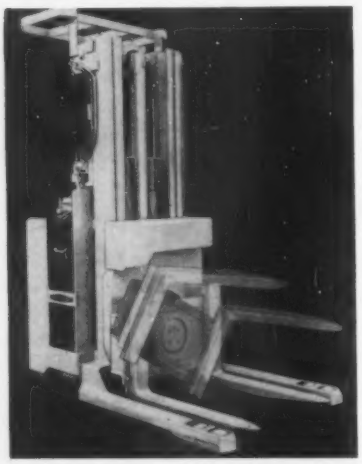
BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

B&W

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 145 or 146.



Revolving fork truck attachment stacks and dumps

An electric truck with revolving forks serves a dual purpose. The revolving feature allows small parts to be dumped from steel boxes into hoppers. When the forks are in a normal position the truck is used to stack boxes in storage areas. A hydraulic motor powers the revolving mechanism through a chain driven sprocket and gear reduction. The forks move in a continuous 360° arc in both clockwise and counterclockwise directions. Movement is controlled by a hand operated hydraulic valve. Oil pressure to operate the revolving fork arrangement is developed by a single motor and pump which also furnishes power for the hydraulic lifting arrangement. The entire assembly is very compact and does not detract from the efficiency of the truck which is especially designed to operate in narrow aisles. The device can be installed on any 4000-lb capacity straddle truck made by the company, according to the manufacturer. *The Raymond Corp.*

For more data circle No. 30 on postcard, p. 145



Noiseless drill saws through reinforced concrete

Drilling through reinforced concrete, steel and the like is done easily and quickly with a recently developed drilling setup. Needing only a 115 or 230-v electrical outlet and a rubber hose attachment from a water tap, the cutter requires no special operating skills. Once the device has been set, no special attention is necessary. Effective in tight locations, the apparatus maintains a constant cutting speed. It has a built-in counter-balancing mechanism that does away with the need for external pressure. Self-sharpening, the machine's sawing bit is faced with specially selected industrial diamonds seated in high-test steel. The diamond-faced bit is self-feeding and reacts automatically to pressures from the machine. Easily transported, the 150-lb driller saws holes one to 6-in. in diameter at the average rate of 1-ipm. The unit operates vertically or horizontally. *General Electric Co.*

For more data circle No. 31 on postcard, p. 145

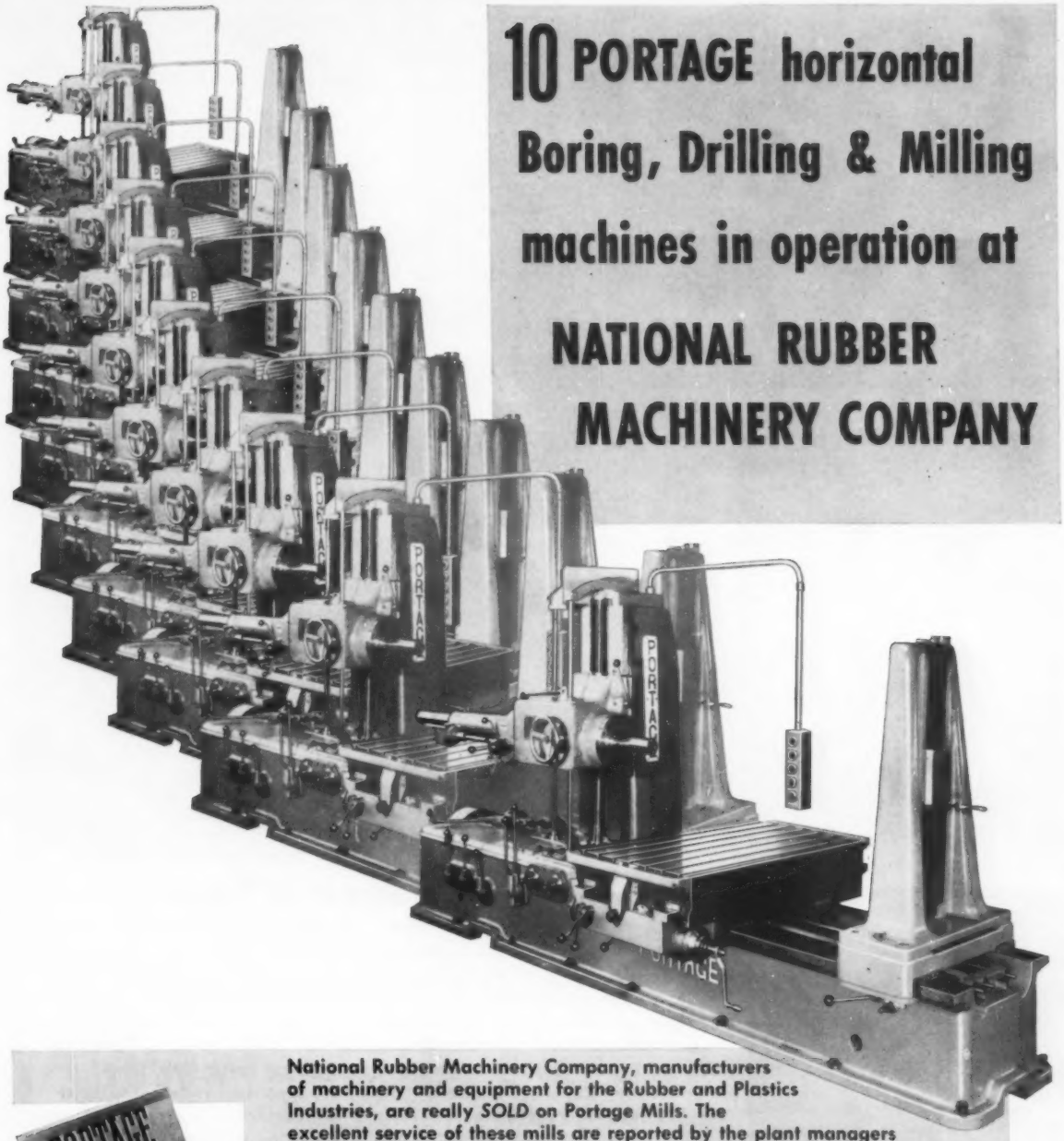


Machine straightens pipe at 1000-fpm and faster

This machine straightens steel or nonferrous pipe and tubes at high speeds. It operates at production speeds up to 1000-fpm and faster, depending on the application. The first three units handle continuous-weld pipe of from ½ to 2-in. at speeds up to 900-fpm. Adjustable-speed, 230-v dc motors rated at 75/100 hp in a range of 400/1600 rpm power the machines. Incorporating a five-roll principle, the rolls are positioned for a horizontal pass line. A pressure roll is located between two sets of opposed rolls with each set having one opposed driven roll and one idler roll. Because only one roll of each pair of cross rolls is driven, wear is reduced and roll life lengthened. While guides ordinarily are used for safety, the machines will operate with or without guides at the user's option. *Sutton Engineering Co.*

For more data circle No. 32 on postcard, p. 145

10 PORTAGE horizontal Boring, Drilling & Milling machines in operation at NATIONAL RUBBER MACHINERY COMPANY





National Rubber Machinery Company, manufacturers of machinery and equipment for the Rubber and Plastics Industries, are really *SOLD* on Portage Mills. The excellent service of these mills are reported by the plant managers at Columbiana, Ohio and the Akron Division plant. This large installation certainly represents a vote of confidence for the performance of Portage Mills . . . and speaking of confidence . . . many leading manufacturers have come to realize that the ruggedness, versatility and low maintenance cost of Portage Mills makes them the best buy . . . and remember . . . their initial capital investment cost is less, without the sacrifice of quality. Write for complete information . . . TODAY.

THE Portage MACHINE CO.

1035 Sweitzer Avenue • Akron 11, Ohio

Representatives in Principal Cities

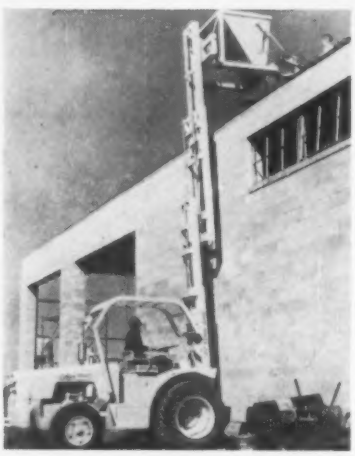
BUILDERS OF PRECISION MACHINE TOOLS, SPECIAL AND PRODUCTION MACHINERY SINCE 1916



Electronic gage measures any internal dimension

Any size internal dimension within the range 5 to 36 in. can be inspected to within several millionths of an inch quickly and accurately with a new electronic internal calibrating master. It is available as a kit, consists of a cylindrical shaped gage handle with a plastic grip that has a gage cartridge mounted in one end and an adjustable and interchangeable screw assembly at the other. A series of ⅝ in. diam bars of different lengths thread into the gage handle to provide the wide range of adjustment. A second plastic grip gage handle, which clamps over the length bars, is provided to facilitate handling long assemblies. A transducer type pickup unit is connected to an electronic amplifier with dual amplifications of either 1000/2000; 2500/5000; 5000/10,000 or 10/20,000 to 1. *Sheffield Corp.*

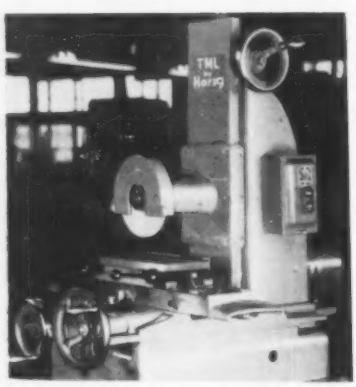
For more data circle No. 33 on postcard, p. 145



Outdoor 21-ft lift truck boosts materials to rooftops

Materials can be hoisted high in the air by a new outdoor lift truck equipped with a 21-ft lift. Moreover, they will operate over rough terrain not accessible to conventional fork trucks. Light steel erection on construction jobs can be accomplished with a boom attachment available as an extra. The high lift model includes many features as standard equipment. These are: a sturdy overhead guard, shuttle transmission (providing six speeds forward and six reverse), power steering and an hour meter. Large diameter front wheels are equipped with 14.00 x 24 tires, set at wide tread for excellent traction and flotation over rough terrain normally associated with the construction industry, and related fields. Large diameter rear wheels with 8.25 x 16 tires, coupled with power steering, provide easy steering and smooth operation in unpaved areas, according to the manufacturer. It is available in three standard models with 5000, 6000 and 7000-lb capacities. *Ottawa Steel Div., L. A. Young Spring & Wire Corp.*

For more data circle No. 34 on postcard, p. 145



Surface grinder offers improved accuracy

Newly improved, this surface grinder offers accuracy and ease of operation. It has a 100 pct faster longitudinal travel per revolution of the hand wheel over former company models. The new design will accommodate standard wheel adapters. Transverse travel is 7-in. and working height under a standard 7-in. diam wheel is 12¼. This is an increase of 3-in. over former models. The grinder is now supplied with pre-packed spindles for long life, clean operation, accuracy and elimination of spindle lubrication. Power is supplied by either ½ or ¾-hp motors. A newly designed cabinet of sturdy construction has a hinged door, inside shelf storage, and is provided with floor levellers. The machine is available without the cabinet for use as a bench model. Total machine weight, including cabinet and motor is 550-lb. *Harig Mfg. Corp.*

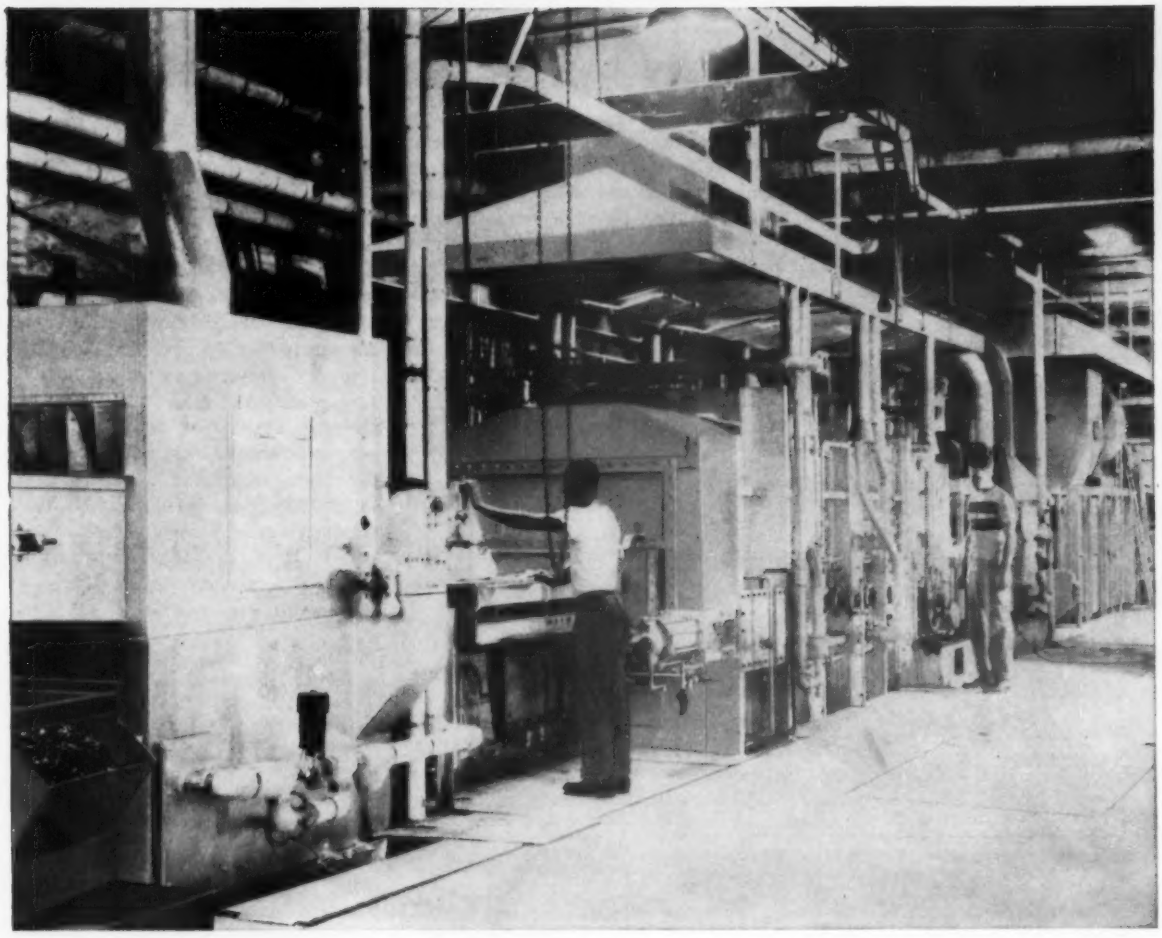
For more data circle No. 35 on postcard, p. 145



Lube and filter pump units provide rolling mill oil

Flood lubrication and filter system pumping units provide rolling oil to a high speed four-high foil mill. The 1000-gal capacity pumping setups are designed to deliver 80-gpm at 40-psi to the discharge nozzles at the foil mill. The rolling oil viscosity is 45-ssu at 100°F. All foreign particles larger than 10 microns are removed by filtration. Units are equipped with necessary pre-heating, timing cooling and thermostatic devices to maintain constant temperatures automatically. A separate pump circulates 18-gpm continuously through a 5-micron fullers earth filter of sufficient capacity to remain in service for 30 days. *Cardwell Machine Co.*

For more data circle No. 36 on postcard, p. 145



Production increased 500% with automatic harden-draw lines

Many things improved when two of these Surface lines were installed by a fastener manufacturer: production (up 500% over previous methods), delivery time, and product quality and uniformity. Either large runs, up to 50,000 fasteners, or small batches of special parts are processed economically. All operations—weighing, loading, first wash, clean hardening, quench, second wash, draw, and rust-proofing—are tied together by timed conveyors and feeders. Surface RX® generator gas permits carburizing as well as clean hardening.

This is one of many demonstrations that Surface automatic heat treating can help you get the most for your production dollar.

SEND FOR BULLETIN SL-164: SURFACE COMBUSTION CORPORATION • 2373 DORR ST., TOLEDO 1, OHIO

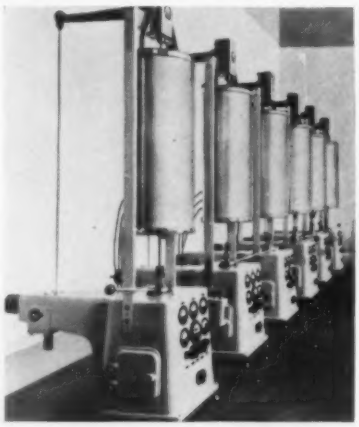
Surface® Heat Treat, Steel Mill, Glass Divisions • Kathabar® Air Conditioning Division
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HEAT TREATING EQUIPMENT

see
J. H. SESSIONS & SON
new
CATALOGS on STAMPINGS & stamped assemblies, ARMED FORCES, BOX & CRATE and TRUNK HARDWARE.
Write
J. H. SESSIONS & SON
290 Riverside Ave.,
Bristol, Conn.

Creep strain tester features design, operation simplicity

Operational and design simplicity are the key features of a new creep strain tester. There are two basic models. One has units in multiples of five furnaces each containing a



single sample; the other model tests up to ten samples in a single furnace. The single-sample models are used chiefly for untried materials. When approximate values are known, it is usually safe to use the much cheaper multiple-sample version. Testing temperatures range up to 1000°C. The batteries of five can be run at five different temperatures and stresses. Temperature readings are accurate within ±0.5°C. The calibrations can be instantly read and recorded. Mountings of samples and extensometers are quickly and easily accomplished. Extensometers can be attached to the samples without turned collars or other working of the metal that might affect the results. Individual furnaces occupy hardly more floor space than an office typewriter. *Mohr & Federhaff AG.*

For more data circle No. 37 on postcard, p. 145

Cloth buff

A new centerless flexible cloth buff is intended to replace full disc buffs for faster cutting and high, soft coloring. Pleating the bias-cut cotton has provided an extra strong buff that wears longer than a full disc buff and remains soft and flexible. The centerless construction feature permits high running speeds without burning or discoloring the work. Instead of being fastened to a solid center, the buff units are securely held in place by a special gripping steel ring, leaving space around the shaft through which cool air circulates in all directions. *American Buff Co.*

For more data circle No. 38 on postcard, p. 145

Furnaces

Continuous carbon tubular element furnaces with tube sizes up to 6-in. ID permit uniform work heating. This is done within a graphite tubular resistance element in which temperatures up to 5000°F can be indefinitely maintained. Purge chambers may be added to maintain low dew-point reducing atmospheres. Quick-opening end compartments permit easy tube replacement. Overall length of the largest unit is 28-ft. Research models with tube diameters down to 1-in. are also available. *Harper Electric Furnace Co.*

For more data circle No. 39 on postcard, p. 145

This 25-TON Hannifin Straightening Press Sells For
$4,455 FULLY EQUIPPED AS SHOWN
Price F.O.B. our press plant at St. Marys, Ohio, subject to change without notice
The ideal press for straightening heat-treated parts up to 60" between centers. Exclusive Hannifin Sensitive Pressure Control for speed and accuracy. Ram block, two table blocks and center-type fixture complete with rails included.
STRAIGHTENING PRESSES FROM 5 TO 150 TONS
Hannifin offers longer tables and rails, roller-type fixtures, larger or smaller capacities (5 to 150 tons)—all at prices that are easily justified by savings on the job. Bring us your straightening problems.
HANNIFIN
HANNIFIN CORPORATION, 513 S. WOLF ROAD, DES PLAINES, ILLINOIS

Nine ton car-bottom furnace has 160 cu ft loading space

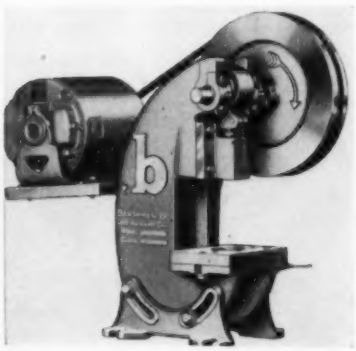


This huge car-bottom furnace is now in operation at the Electronics Components Div., Stackpole Carbon Co., St. Mary's Pa. It has 160 cu ft of loading space. The furnace carries out high temperature calcining of conductor material for fixed composition resistors. Designed for a maximum temperature of 2750°F, the unit has a usable chamber 4-ft sq and 10-ft in depth. It is heated by 1¾-in. diam nonmetallic resistance elements. They use a maximum of 320-kw supplied through eight 40-kw transformers. These have 36 steps of voltage control each. The car is equipped with a pneumatically operated rising sand seal. In raised position, this seals the car and the furnace. *Harper Electric Furnace Corp.*

For more data circle No. 40 on postcard, p. 145

Punch press

A manufacturer has equipped its 2-ton punch press with the same type of heavy-duty clutch recently installed on its 5- and 8-ton models. The new clutch design contains an oversize, sliding-key-type clutch dog encased by a strong steel collar.



This removes the driving load from the crankshaft keyway. The design was originally perfected for the 8-ton press, adopted as standard on the 5-ton model after a year of testing and will now become standard equipment on the 2-ton units. *Benchmaster Mfg. Co.*

For more data circle No. 41 on postcard, p. 145

Temperature controls

Just one multi-point pyrometer controller permits automatic temperature control of 4 to 10 separate units. The instrument combines the accuracy of a null balance potentiometer measuring circuit with speed of an electronic control system. It applies to almost any installation suitable for two-position control action. *Thermo Electric Co., Inc.*

For more data circle No. 42 on postcard, p. 145

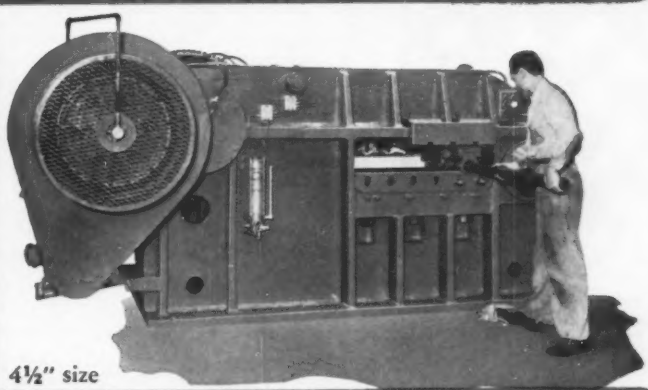
The Really NEW IDEA

In Billet Shears . . .

Now Proven In Service

HILL ACME BAR BILLET SHEAR

GET THE FACTS—SEE ONE IN OPERATION



4½" size

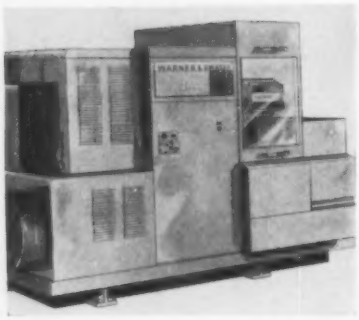
- Simplicity of Design. Clean, square cuts. Low maintenance.
- You'll be amazed at it's performance. You'll be surprised at the price.
- Made in 3", 4½", 6½" sizes and larger. Choice of hand, semi-automatic or fully automatic feed.

Full details and specifications are given in Bulletin SP-56.

THE HILL ACME COMPANY

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"HILL" GRINDING & POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • ALSO MANUFACTURERS OF "ACME" FORGING • THREADING TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • BILLET SHEARS • PORTABLE FLOOR CRANES • "CLEVELAND" KNIVES • SHEAR BLADES



Single spindle unit automatically works complex pieces

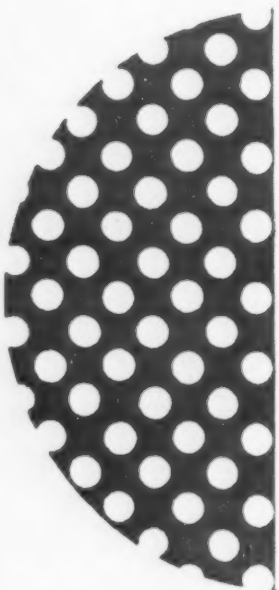
Engineered for fast, automatic machining, this single spindle automatic chucking unit works large, complex pieces in one operation. It combines accuracy, quick setup and easy operation and is recommended for long or short-run operation. The machine provides automatic regulation of spindle speeds, feed changes, cutting stroke length, turret indexing and both front and rear cross slide operation. Speed and feed changes can be made under cut to maintain cutting conditions. Its operator has only to load the workpiece, press the cycle button, and then unload the finished work. The unit swings 13½-in. over the cross slide and offers a maximum pentagon turret working stroke of 11-in. The spindle has an 11-in. flanged nose, and is equipped with an air-operated 15-in. chuck. *Warner & Swasey Co.*

For more data circle No. 43 on postcard, p. 145

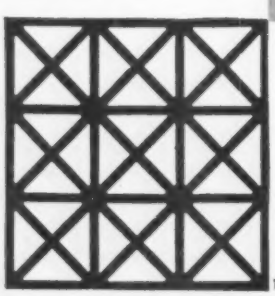
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for every type of perforation

- All metals including stainless and carbon steel, monel, copper, brass, bronze and aluminum.
- Fabricating facilities include rolling, forming, shearing, welding and assembling.
- Material to be perforated can be supplied either by us or by your company.







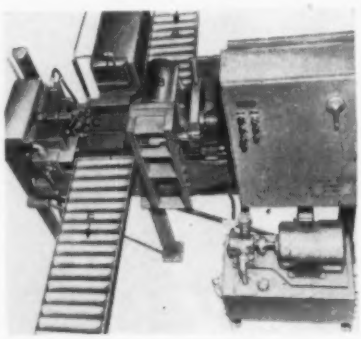
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WISSCO
PERFORATED METALS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

1986

Numbering machine

Following previous operations, this automated serial numbering machine marks transmissions in six seconds flat. It receives the transmissions over a roller conveyor which, by gravity, positions them against a spring cushioned stop.



On contact, a micromatic switch starts the marking. Cases are then moved to the numbering head. The ejector then pushes marked cases onto another roller conveyor to rejoin the manufacturing cycle. *Cadillac Stamp Co.*

For more data circle No. 44 on postcard, p. 145

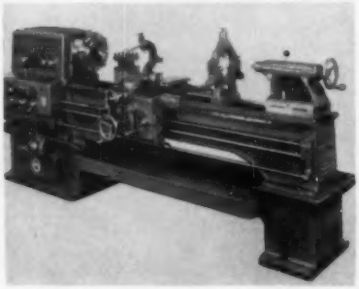
Die head

A new convertible self-opening die head with aligning shank is primarily for use on Brown and Sharpe and other small screw machines of either the automatic or hand type. It is equipped with both an outside trip for short length, fine pitch shoulder threading and a pull-off trip for longer threads. *Greenfield Tap and Die Corp.*

For more data circle No. 45 on postcard, p. 145

Lathes

Low-priced, this model is one of a new line of toolroom and production lathes. They come in 12 different sizes from 12 x 20-in. to 20 x 100-in. This 20 x 60-in. geared head lathe has 18 spindle speeds



and 56 longitudinal and cross feeds. Speeds, ranging up from 3000-rpm, are all easily selected by a gear box control lever located within easy reach of the left hand. To insure high surface finish, the final high-speed spindle drive is actuated by a direct V-belt transmission through the gear box to the spindle, by-passing the gears. The spindle-mounted V-belt sheaves are totally enclosed and mounted independently of the spindle on antifriction roller bearings housed in the headstock casting. *S & S Machinery Co.*

For more data circle No. 46 on postcard, p. 145

Electric hoist

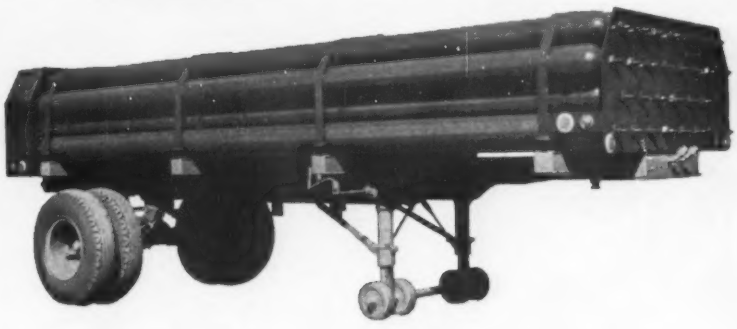
Equipped with fractional horsepower 1800/450 rpm motors, this two-speed electric hoist provides a fast lifting and lowering speed and a slow, ¼ normal speed, for gentle positioning of production work. Test installations indicate maintenance savings of more than 50 pct over other types of small electric hoists. The housing is designed so that the side and end covers can be quickly unscrewed for quick servicing of exposed parts. Two easy adjustments of a set screw are all that is required to compensate for brake lining wear. It is available in parallel mounting, cross mounting, hook mounting and rigid or bolt mounting. *American Chain & Cable Co., Inc.*

For more data circle No. 47 on postcard, p. 145

REDUCE CYLINDER HANDLING up to 50%

with INDEPENDENT *Gas Supply TRAILERS*

TRANSPORTING — Argon — Carbon Dioxide — Helium — Nitrogen — Oxygen — Boron Trifluroide — Hydrogen — Ethylene. Trailer capacities from 187,000 cu. in. to 750,000 cu. in. water capacity. Trailer tubes ICC3A-2400 Specifications with 2400 PSIG Working Pressure.



Sizes and weights to meet all State requirements.

Can be mounted on bases for permanent storage.

INDEPENDENT ENGINEERING CO., Inc.

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SILENT HOIST KRANE KAR

"HAS GIVEN US EXCELLENT SERVICE AT LOW MAINTENANCE COST," says ATLAS FORGINGS COMPANY CICERO, ILL.

"KRANE KAR Unloads freight cars of billets weighing up to 6000 lbs. . . . Stacks them in yard . . . Transports billets to saw shop . . . Loads forgings on trucks for shipment. KRANE KAR is easier to use than our old stationary crane, and saves us time. Now we can make full use of our yard for billet inventory." *Ask for Bulletin #79.*

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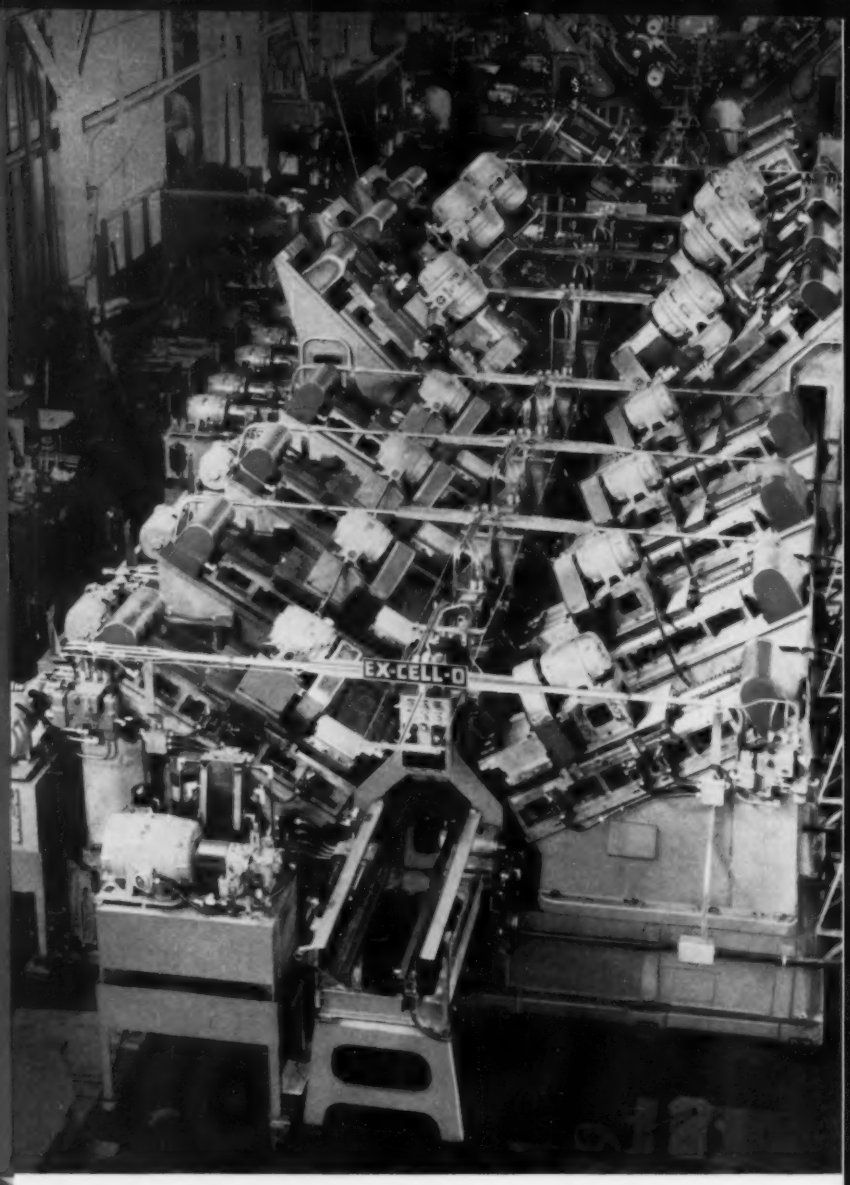
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XLO

EX-CELL-O FOR PRECISION

3000 Engine Blocks Per Day -

How one company competes in the world's toughest market . . .





The photograph above is a view in the auto plant shortly after the automation line was installed. At right above, a portion of the line as it neared completion in the Ex-Cell-O plant.

These Ex-Cell-O automation machines play an important part in turning out engine blocks for one of the "big three" of the automotive industry. This manufacturer's engine must compete in one of the toughest markets in the world.

Ex-Cell-O's part in the manufacturing process is 1200 feet of production line using the newest machines in assembled integrated units. Among the precision machining operations performed are boring, broaching, chamfering, milling, reaming and grooving.

Ex-Cell-O—builders of standard and special machine tools for 25 years—uses standard bases and subassemblies wherever possible. This means that product changes do not necessarily obsolete equipment. You save, too, in initial cost.

EX-CELL-O CORPORATION
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MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

56-43

The Iron Age SUMMARY . . .

Suez impact on Europe will affect U. S. Steel market in January . . . Mills fight rising costs . . . Wages to go up Jan. 1 . . . Base prices will hold, but extras will rise.

Suez Impact . . . The delayed impact of Suez probably will hit the steel market in January. U. S. efforts to help Europe weather the aftermath of the "little war" in Egypt will affect such critical products as plates, structurals, and pipe.

The European oil shortage will affect steel supply in the U. S. in two ways. It will hurt European steel output and thus increase export demand; and it will intensify demand for oil country steel, and plate for builders of oil tankers and railroad tank cars.

The strain on supply of these products will bring new demands for government control of allocations. Formal government controls are not likely. But a way will be found to channel steel to vital industries. And the result will be the same: more steel for some users, less for others.

Meanwhile, steel mills are fighting a desperate battle against rising costs. (Page 83) Some companies are using every device short of base price increase to bolster profit margins.

Price Pressures . . . The cost-versus-price struggle approaches a climax as the mills head into one of the busiest periods in steel history. The combination portends an upward break in steel prices soon—probably in the form of steel extra boosts as opposed to base price advances.

It's estimated that by January 1 steel production costs will have risen a conservative $5 a ton since the steel labor wage settlement of last August. At that time, the mills boosted base prices an average of $8.50 a ton. But the increase was considered by some to be less than enough to cover cost boosts up to that time.

Record steel scrap prices are the major threat to steel earnings. But other raw materials also have risen. These include coal, ferroalloys, iron ore, and pig iron: Freight rates are likely to rise in the near future. Under the cost-of-living clause in labor contracts, steel wages are expected to rise 3¢—possibly 4¢— an hour Jan. 1.

Offsetting Device . . . Under these conditions, something has to give. If base prices are not increased, then steel price extras—charges made by the mills for special processing and handling —will go up. Perhaps as much as $3 a ton.

Some mills have adopted escalator clauses based on THE IRON AGE scrap prices to offset higher scrap costs. In at least one instance, this has forced the prices of billets, blooms, and slabs to over $130 a ton in the conversion market. The going mill price for carbon rerolling quality is $74 a ton; for forging quality, $91.50 a ton.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,474	2,486	2,474	2,308
Ingot Index				
(1947-1949=100)	154.0	154.8	154.0	149.2
Operating Rates				
Chicago	102.0	102.0*	100.0	99.0
Pittsburgh	95.0	96.0	102.0	102.0
Philadelphia	105.0	104.0	105.0	103.0
Valley	100.0	99.0	99.0	98.0
West	102.0	103.5*	100.0	102.5
Detroit	103.0	107.0	104.0	98.0
Buffalo	105.0	105.0	105.0	105.0
Cleveland	105.0	106.5*	99.0	102.0
Birmingham	94.0	95.0	96.0	94.5
S. Ohio River	94.0	96.0*	96.0	96.0
Upper Ohio R.	105.0	105.0	103.0	103.0
St. Louis	105.0	102.0	107.0	104.0
Northeast	100.0	100.0	100.0	88.5
Aggregate	100.5	101.0	100.5	99.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.622	5.622	5.622	5.174
Pig Iron (Gross Ton)	$63.04	$63.04	$63.04	$59.09
Scrap, No. 1 hvy (gross ton)	$65.17	$64.33	$59.83	$49.50
Nonferrous				
Aluminum ingot	27.10	27.10	27.10	24.40
Copper, electrolytic	40.00	40.00	40.00	43.00
Lead, St. Louis	15.80	15.80	15.80	15.30
Magnesium ingot	36.00	36.00	36.00	33.25
Nickel, electrolytic	64.50	64.50	64.50	64.50
Tin, Straits, N. Y.	110.50	111.50	111.25	103.875
Zinc, E. St. Louis	13.50	13.50	13.50	13.00

*Revised

Auto Buyers Leveling Off

Carmakers will probably go to Dec. 15 deadline before making commitments for February . . . Billets for conversion are bringing high prices . . . Rails for rerolling scarce.

◆ AN EFFORT to level out buying and selling by the auto producers and the mills is evident. Both may be concerned about product overloading which occurred this year and last.

Producers are still indicating they are light on orders for cold-rolled sheet. However, in one area at least, conversion for hot-rolled continues and is solid through the first quarter.

January orders for cold-rolled are about on a par with December's, according to a major producer. Indications are that carmakers will go down to the Dec. 15 deadline before making formal commitments for February.

Consumers interested in hot-rolled sheet conversion report difficulty in finding mills able to roll the sheet from slab. Costs of slabs, ingots, and billets are also a deterrent.

Billet sales for use as hot-rolled bar are being pegged to steel scrap prices. Differential, in some cases, has taken billet costs up over $130 in the conversion market.

While the reroller bar picture is a little brighter, there are still two knotty problems unsolved. One is getting needed supplies of reroller rail and the other is the price that must be paid—if they can be gotten.

October tonnage of rail received by the producers was almost 13,000 tons above September's. However, with reroller rail prices hovering around the $93-95 level and giving indication of going higher, the producers are having trouble keeping their costs above the break-even report.

Supplies reached their lowest ebb in August when they were less than 50 pct of the amount taken in by reroller mills in the same month of 1955. In addition, reroller rail demand was continuing strong. Supplies of reroller rail in mill inventories were shrinking. They continued to fall through the year, with only October showing a slight buildup. Heavy demand from the construction industry has pushed requests for reroller concrete reinforcing bar to levels exceeding 1955.

American Can Co. has announced plans to build facilities for processing coiled tinplate stock received from the mills. The program—costing $27 million—begins in 1957 with construction and operation of plants at Hammond, Ind., Oakland, Calif., Tampa, Fla. and Hillside, N. J. Work is also slated to start next year on four other units. Equipment will be designed to handle coils up to 1500 lb.

SHEET AND STRIP . . . January schedules at **Cleveland** for sheet are about full. Some deferred auto tonnage was taken by consumers. Carmakers are still holding back on releases and sheet producers feel confident January orders will be slightly higher. Cold-rolled strip carries a 3-4 week delivery date although a pickup in the major markets of auto and appliances has been indicated.

Pittsburgh mills describe hot-rolled sheet as tight. Galvanized is still soft. Demand for both sheet and strip at **Detroit** is reported "good."

At **Chicago** hot-rolled sheet and strip are sold out for the first quarter. However, cold-rolled strip is still available for 6-week delivery. Some mills are offering spot tonnages of cold-rolled sheet for February. Hot-rolled strip is booked solid with customers on a quota basis for the first quarter. Mills report turning away business. There's a slowdown in cold-rolled strip.

BARS . . . Carbon bars at **Cleveland** are just about sold out through the first quarter. Occasional shipments are being turned back to mills because construction projects are held up due to plate and structural shortages. Mills are making full shipments of bars to auto plants during December with deliveries being current.

Demand for bars at **Pittsburgh** is holding up at a good level. Spot shortages of hot-rolled bars are showing up new demands for comparable cold-finished products. Supplies are plentiful at **Detroit.**

Hot-rolled bar production continues strong at **Chicago.** Mills are booked through January on the **West Coast.**

PIPE AND TUBING . . . **Pittsburgh** producers of oil country goods are working under heavy pressure from drillers. With most shipments going directly to users, field stocks are down to emergency minimums. Demand for welded pipe is holding up well.

Mechanical tubing plants in **Cleveland** area are only working at about 80 pct of capacity partly because of an apparently high inventory in auto plants.

Billets for conversion into tube are being turned down at **Chicago,** but only because of lack of space on tube piercing mills.

PLATES AND STRUCTURALS . . . One plate user at **Chicago,** on the basis of present mill allocations and projected supply, is booked through the first quarter of 1960. Mills are continuing to ask for relief on commitments to customers for plate and hot-rolled sheet in the first quarter, but without any luck. Both grades are being taken in the full amount of the original agreed tonnage. Above market prices on small lots of structurals as well as conversion prices, are being paid by some fabricators to avoid contract penalties.

At **Pittsburgh** heavier plates and structurals of all sizes are as scarce as ever. Demand for light plates has dropped off a little.

Purchasing Agent's Checklist

SPECIAL REPORT: Costs prod mills toward steel price increase . . p. 83

PACKAGING: Reconditioned drums save money and steel . . . . . p. 87

BUSINESS: How small business can get U. S. contracts . . . . . p. 88

MARKETING: Screw machine product sales are spiraling . . . . . p. 92

Comparison of Prices

(Effective Dec. 4, 1956)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Dec. 4 1956	Nov. 27 1956	Nov. 6 1956	Dec. 7 1955
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.675¢	4.675¢	4.675¢	4.325¢
Cold-rolled sheets	5.75	5.75	5.75	5.325
Galvanized sheets (10 ga.)	6.30	6.30	6.30	5.85
Hot-rolled strip	4.675	4.675	4.675	4.325
Cold-rolled strip	6.870	6.870	6.870	6.29
Plate	4.87	4.87	4.87	4.52
Plates, wrought iron	10.40	10.40	10.40	10.40
Stainl's C-R strip (No. 302)	47.50	47.50	47.50	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.95	$9.95	$9.95	$9.05
Tinplates, electro (0.50 lb.)	8.65	8.65	8.65	7.75
Special coated mfg. ternes	9.20	9.20	9.20	7.85
Bars and Shapes: (per pound)				
Merchant bars	5.075¢	5.075¢	5.075¢	4.65¢
Cold finished bars	6.85	6.85	6.85	5.90
Alloy bars	6.125	6.125	6.125	5.65
Structural shapes	5.00	5.00	5.00	4.60
Stainless bars (No. 302)	40.75	40.75	40.75	38.25
Wrought iron bars	11.50	11.50	11.50	11.50
Wire: (per pound)				
Bright wire	7.20¢	7.20¢	7.20¢	6.25¢
Rails: (per 100 lb.)				
Heavy rails	$5.075	$5.075	$5.075	$4.725
Light rails	6.00	6.00	6.00	5.65
Semifinish Steel: (per net ton)				
Rerolling billets	$74.00	$74.00	$74.00	$68.50
Slabs, rerolling	74.00	74.00	74.00	68.50
Forging billets	91.50	91.50	91.50	84.50
Alloy blooms, billets, slabs	107.00	107.00	107.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.80¢	5.80¢	5.80¢	5.025¢
Skelp	4.225	4.225	4.225	4.225
Finished Steel Composite: (per pound)				
Base price	5.622¢	5.622¢	5.622¢	5.174¢

	Dec. 4 1956	Nov. 27 1956	Nov. 6 1956	Dec. 7 1955
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$67.76	$67.76	$67.76	$63.69
Foundry, Valley	63.00	63.00	63.00	59.00
Foundry, Southern Cin'ti	67.17	67.17	67.17	62.93
Foundry, Birmingham	59.00	59.00	59.00	55.00
Foundry, Chicago	63.00	63.00	63.00	59.00
Basic del'd Philadelphia	66.84	66.84	66.84	62.77
Basic Valley furnace	62.50	62.50	62.50	58.50
Malleable, Chicago	63.00	63.00	63.00	59.00
Malleable, Valley	63.00	63.00	63.00	59.00
Ferromanganese, cents per lb‡ 74 to 76 pct Mn base.	11.75¢	11.75¢	11.75¢	9.50¢
Pig Iron Composite: (per gross ton)				
Pig iron	$63.04	$63.04	$63.04	$59.09
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$66.50	$66.50	$61.50	$49.50
No. 1 steel, Phila. area	62.50	62.50	57.50	49.50
No. 1 steel, Chicago	**66.50**	64.00	60.50	49.50
No. 1 bundles, Detroit	60.50	60.50	60.50	45.50
Low phos., Youngstown	**70.50**	69.50	68.50	54.50
No. 1 mach'y cast, Pittsburgh	61.50	61.50	61.50	54.50
No. 1 mach'y cast, Philadel'a	**59.50**	58.50	58.00	56.50
No. 1 mach'y cast, Chicago	58.50	58.50	56.50	56.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	**$65.17**	$64.33	$59.83	$49.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.50	$15.50	$14.50	$14.25
Foundry coke, prompt	$18-19	$18-19	$17-18	$16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	40.00	40.00	40.00	43.00
Copper, Lake, Conn.	40.00	40.00	40.00	43.00
Tin, Straits, New York	*110.50*†	111.50	111.25	103.875
Zinc, East St. Louis	13.50	13.50	13.50	13.00
Lead, St. Louis	15.80	15.80	15.80	15.30
Aluminum, virgin ingot	27.10	27.10	27.10	24.40
Nickel, electrolytic	64.50	64.50	64.50	64.50
Magnesium, ingot	36.00	36.00	36.00	33.25
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producers, see Key on P. 192→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	64.50	65.00	65.50	66.00	.....
Birdsboro, Pa. *B6*	64.50	65.00	65.50	66.00	.....
Birmingham *R3*	58.50	59.00*	.....	.....	.....
Birmingham *W9*	58.50	59.00*	63.00	.....	.....
Birmingham *U4*	58.50	59.00*	63.00	.....	.....
Buffalo *R3*	62.50	63.00	63.50	64.00	.....
Buffalo *H1*	62.50	63.00	63.50	.....	.....
Buffalo *W6*	62.50	63.00	63.50	64.00	.....
Chester *P2*	64.50	65.00	65.50	.....	.....
Chicago *I4*	62.50	63.00	63.00	63.50	.....
Cleveland *A5*	62.50	63.00	63.00	63.50	67.50†
Cleveland *R3*	62.50	63.00	63.00	63.50	.....
Duluth *I4*	62.50	63.00	63.00	63.50	67.50†
Erie *I4*	62.50	63.00	63.00	63.50	67.50†
Everett *M6*	.....	63.75	64.25	.....	.....
Fontana *K1*	70.00	70.50	.....	.....	.....
Geneva, Utah *C7*	62.50	63.00	.....	.....	.....
Granite City *G2*	64.40	64.90	65.40	.....	.....
Hubbard *Y1*	.....	.....	63.00	.....	.....
Lone Star *L3*	58.50‡	59.00‡	.....	.....	.....
Midland *C11*	62.50	.....	.....	.....	.....
Minnequa *C6*	64.50	65.00	65.50	.....	.....
Monessen *P6*	62.50	.....	.....	.....	.....
Neville Is. *P4*	62.50	63.00	63.00	63.50	67.50†
N. Tonawanda *T1*	.....	63.00	63.50	64.00	.....
Pittsburgh *U1*	62.50	.....	63.00	63.50	.....
Sharpsville *S3*	62.50	63.00	63.00	63.50	.....
So. Chicago *R3*	62.50	63.00	63.00	.....	.....
Steel on *B3*	64.50	65.00	65.50	66.00	70.50
Swedeland *A2*	64.50	65.00	65.50	65.50	.....
Toledo *I4*	62.50	63.00	63.00	63.50	.....
Troy, N. Y. *R3*	64.50	65.00	65.50	66.00	.....
Youngs own *Y1*	.....	.....	63.00	63.50	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. * Add $1.00 for 0.31-0.69 pct phos. † Intermediate low phos. ‡ Add $1.00 for 0.31 to 0.50 pct phos.

Silvery Iron: Buffalo, *H1*, $72.50; Jackson, *J1*, *I4* (Globe Div.), $71.50; Niagara Falls (15.01-15.50), $99.50; Keokuk (14.01-14.50), $102.00; (15.51-16.00), $105.00. Add $1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 14 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon: $64.00.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill.

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	19.75	21.00	20.50	22.00	—	23.25	35.25	28.25	32.75	—	16.00	27.75	16.25
Slabs, billets	24.50	27.25	25.25	28.00	28.50	29.25	44.50	35.75	42.00	—	20.75	—	21.00
Billets, forging	—	33.00	33.75	34.00	37.00	36.00	56.25	42.25	50.25	30.75	27.25	27.75	27.75
Bars, struct.	39.00	39.25	40.50	40.75	43.75	43.00	66.75	50.25	59.00	36.25	32.50	33.00	33.00
Plates	—	41.25	42.50	43.00	45.50	45.75	70.25	54.50	63.75	38.75	33.75	35.50	34.50
Sheets	45.00	45.25	47.25	47.50	55.75	50.25	74.75	60.00	73.00	46.50	38.75	46.50	39.25
Strip, hot-rolled	33.00	35.75	34.00	36.75	—	39.75	63.50	48.75	58.25	—	29.75	—	30.75
Strip, cold-rolled	41.50	45.25	43.75	47.50	52.00	50.25	74.75	60.00	73.00	46.50	38.75	46.50	39.25
Wire CF; Rod HR	—	37.25	38.35	38.75	41.50	40.75	63.50	48.00	56.25	34.50	31.00	31.50	31.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1* (.25 per lb higher); New Bedford, Mass., *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R5*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*.

Record Price Climb Continues

Follow-up orders keep price climb going . . . But some signs indicate peak may be near . . . Industrial lists fail to follow upward market trend.

◆ HOW MUCH HIGHER can scrap prices go?

Scrap prices continued their climb in new record territory this week sending THE IRON AGE Composite Price up another notch to $65.17 from last week's previous record of $64.33.

But reading between the lines of scrap reports are indications that the ceiling may be near. Scattered industrial lists, for example, did not show the strength that might have been expected in the wake of last week's activity.

Detroit automotive lists brought only $2 over last month's average. This differential had already been reflected in quotations and the new prices brought no immediate dealer orders at higher prices.

In the Pittsburgh area, some industrial lists were off a full $1 and low phos is down $1 on the basis of a purchase by a major consumer.

Many of the price increases this week are follow-ups of last week's orders in Pittsburgh and elsewhere. These new, high prices spread to outlying districts that were not immediately affected by the puchase. Most are now in line, with differentials equalized and other consumers active in the market at established prices.

Other price increases of significant size showed up in turnings and secondary grades. These brought comparatively higher prices later in the week following the major steelmaking grade purchases.

Pittsburgh . . . Mill resistance to high prices of industrial and specialty scrap has brought a slight easing of these grades. Nearby industrial bundles were off $1 on the latest list. Low phos is down $1 on a purchase by a major consumer. In the openhearth grades, a mill on the fringe of the district is offering dealers $66 for No. 1 heavy melting and $58 for No. 2 heavy melting. These prices are in line with those paid by a local mill recently, although the fringe mill had been paying several dollars over the local price in past buys. None of these moves indicates any real weakness. Early attempts to buy at $4 under the mill price met with no success. One mill appears to be resigned to the present level to pull in good scrap.

Chicago . . . Prices moved up again in increases of $2 to $3 following mill buying last week. Railroad lists advanced about the same time. With scrap supplies low, the entire list advanced against strong mill resistance. Offers to buy industrial grades at previous prices failed to hold the general advance in dealer grades. Factory bundles advanced substantially, and the No. 2 grades began showing greater strength.

Philadelphia . . . Steelmaking grades held steady as most mills fell in line with a big corporation purchase that set a record last week. Opinion is widespread that these prices are at or near the very top. But blast furnace scrap jumped from $3 to $5. Lesser increases were reported for some cast grades, low phos and electric furnace bundles.

New York . . . Prices of openhearth and cast grades jumped on the basis of new mill sales. Export continues moderate to strong, bolstering a very active domestic market.

Detroit . . . The market continues to show strength here. December lists closed at a little over $66 for No. 1 grades, which is about $2 higher than last month. No new orders for dealer scrap have been placed as yet. Local mills apparently obtained comfortable industrial tonnages from the lists and are waiting for the market to settle down before placing any dealer orders.

Cleveland . . . Secondary grades picked up some additional steam in the Valley as a mill raised its price for No. 2 heavy melting. Competition with foundries was the cause. The mill bought No. 2 bundles at $52 with small additional tonnage at $53. Local auto lists of factory bundles went for about the same as a month ago. Some mills are pressuring brokers for orders because of a continued hold-up on local shipments and direct movement of factory bundles.

Birmingham . . . The scrap market continues strong, but consumers are managing to hold down price increases. An Alabama mill that bought tonnage recently has held up shipments. Demand for electric furnace grades is steady at quoted prices and mills are reported to be finding sufficient scrap in nearby areas. Despite the fact that this is the season for a slowdown in pipe manufacturing, the marks for cast continues strong.

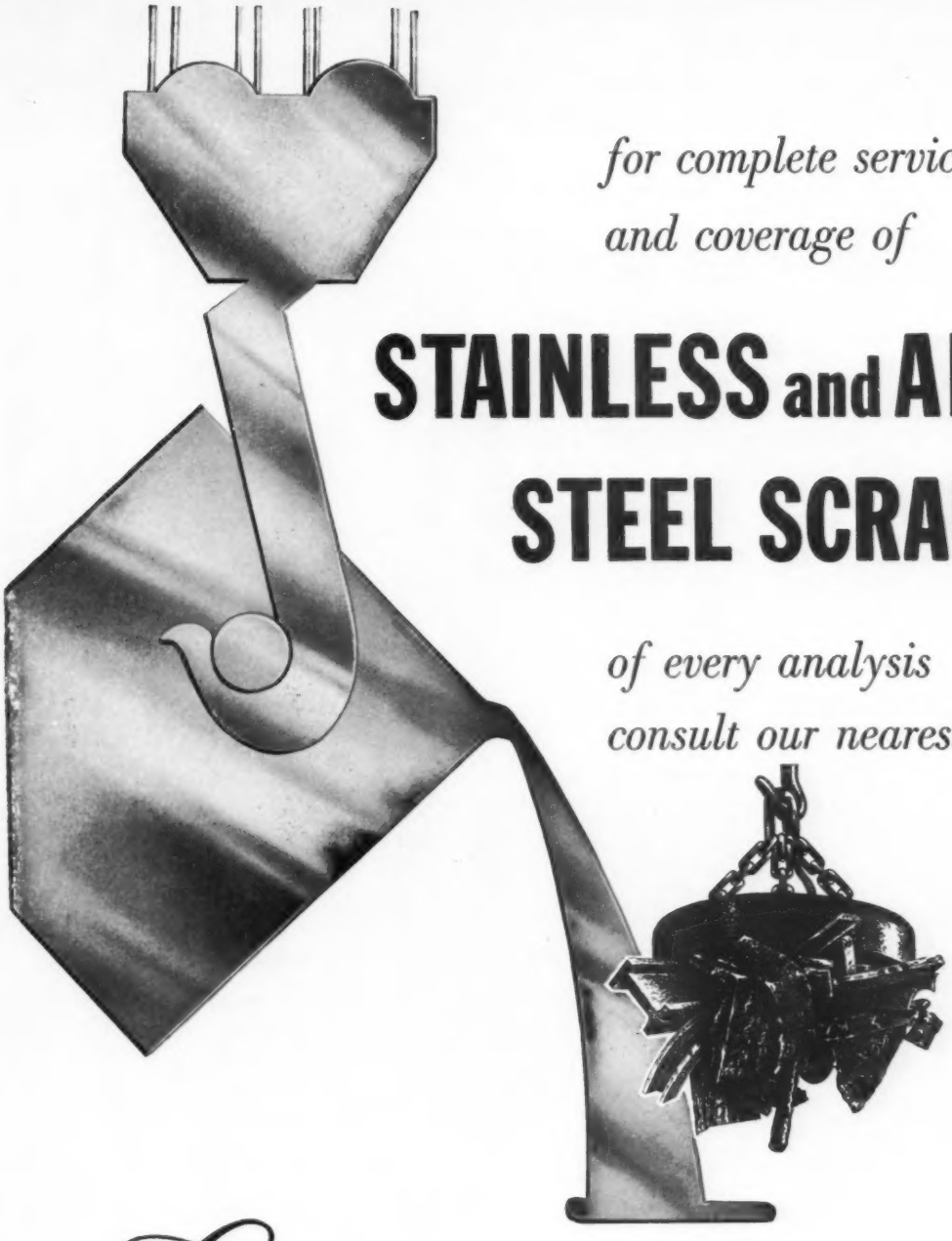
St. Louis . . . Mills are taking in about as much scrap as they can handle. This is the way they appear to like it, rather than lay down material at present high prices.

Cincinnati . . . Prices went up $3 for the month as a local and area mill came into the market for good tonnages. Yield from dealer yards is expected to be rather slow because agricultural scrap was cleaned out in first price rise this fall. Some is being held for tax advantage. Some mill tonnage believed coming from as far as Detroit. Foundry market continues slow.

Buffalo . . . The market jumped to record levels on the strength of outside market areas and low local supplies. There were no sales in this market, although a local mill was expected to enter the market at any moment. Steelmaking grades jumped $4 to a record $60-$61 level. Most other grades were up as well.

Boston . . . The market broke wide open with virtually every consumer active in the market. Pennsylvania mills purchased heavy tonnages of scrap in the area and New England mills are also purchasing.

West Coast . . . Prices are holding steady in Los Angeles and Seattle, but No. 1 heavy melting went up $1 in San Francisco. However, No. 2 bundles dropped, widening the differential between primary and secondary grades. Mills are getting ample supplies.



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IMPORT & EXPORT — **LIVINGSTON & SOUTHARD, INC.,** 99 Park Ave., New York, N. Y. • *Cable Address:* **FORENTRACO**

Scrap Prices *(Effective Dec. 4, 1956)*

Pittsburgh

No. 1 hvy melting	$66.00 to $67.00
No. 2 hvy. melting	58.00 to 59.00
No. 1 bundles	66.00 to 67.00
No. 1 factory bundles	74.00 to 75.00
No. 2 bundles	53.00 to 54.00
Machine shop turn.	42.00 to 43.00
Mixed bor. and ms. turn.	42.00 to 43.00
Shoveling turnings	47.00 to 48.00
Cast iron borings	47.00 to 48.00
Low phos. punch'gs plate	72.00 to 73.00
Heavy turnings	59.00 to 60.00
No. 1 RR. hvy. melting	70.00 to 71.00
Scrap rails, random lgth.	78.00 to 79.00
Rails 2 ft and under	82.00 to 83.00
RR. steel wheels	75.00 to 76.00
RR. spring steel	75.00 to 76.00
RR. couplers and knuckles	75.00 to 76.00
No. 1 machinery cast	61.00 to 62.00
Cupola cast	54.00 to 55.00
Heavy breakable cast	52.00 to 53.00

Chicago

No. 1 hvy. melting	$66.00 to $67.00
No. 2 hvy. melting	56.00 to 57.00
No. 1 factory bundles	73.00 to 75.00
No. 1 dealers' bundles	66.00 to 67.00
No. 2 dealers' bundles	51.00 to 52.00
Machine shop turn.	43.00 to 44.00
Mixed bor. and turn.	45.00 to 46.00
Shoveling turnings	45.00 to 46.00
Cast iron borings	45.00 to 46.00
Low phos. forge crops	76.00 to 77.00
Low phos. punch'gs plate	73.00 to 74.00
Low phos. 3 ft and under	71.00 to 72.00
No. 1 RR. hvy. melting	72.00 to 74.00
Scrap rails, random lgth.	83.00 to 84.00
Rerolling rails	94.00 to 95.00
Rails 2 ft and under	91.00 to 92.00
Locomotive tires, cut	76.00 to 77.00
Cut bolsters & side frames	76.00 to 77.00
Angles and splice bars	81.00 to 82.00
RR. steel car axles	95.00 to 96.00
RR. couplers and knuckles	75.00 to 76.00
No. 1 machine cast	58.00 to 59.00
Cupola cast	53.00 to 54.00
Heavy breakable cast	51.00 to 52.00
Cast iron brake shoe	50.00 to 51.00
Cast iron wheels	58.00 to 60.00
Malleable	73.00 to 74.00
Stove plate	50.00 to 51.00
Steel car wheels	76.00 to 77.00

Philadelphia Area

No. 1 hvy. melting	$62.00 to $63.00
No. 2 hvy. melting	55.00 to 56.00
No. 1 bundles	62.00 to 63.00
No. 2 bundles	53.00 to 54.00
Machine shop turn.	45.00 to 46.00
Mixed bor. short turn.	45.00 to 46.00
Cast iron borings	45.00 to 46.00
Shoveling turnings	48.00 to 49.00
Clean cast chem. borings	51.00 to 52.00
Low phos. 5 ft and under	67.00 to 68.00
Low phos. 2 ft and under	69.00 to 70.00
Low phos. punch'gs	69.00 to 70.00
Elec. furnace bundles	64.00 to 65.00
Heavy turnings	58.00 to 59.00
RR. steel wheels	71.00 to 72.00
RR. spring steel	71.00 to 72.00
Rails 18 in. and under	80.00 to 82.00
Cupola cast	52.00 to 54.00
Heavy breakable cast	58.00 to 59.00
Cast iron car wheels	64.00 to 65.00
Malleable	68.00 to 69.00
Unstripped motor blocks	44.00 to 45.00
No. 1 machinery cast	59.00 to 60.00

Cleveland

No. 1 hvy. melting	$64.50 to $65.50
No. 2 hvy. melting	55.00 to 56.00
No. 1 bundles	64.50 to 65.50
No. 1 factory bundles	71.00 to 72.00
No. 2 bundles	46.00 to 47.00
No. 1 busheling	64.50 to 65.50
Machine shop turn.	35.00 to 36.00
Mixed bor. and turn.	39.00 to 40.00
Shoveling turnings	39.00 to 40.00
Cast iron borings	39.00 to 40.00
Cut struct'r'l & plates, 2 ft. & under	70.00 to 71.00
Drop forge flashings	65.50 to 66.50
Low phos. punch'gs, plate	65.50 to 66.50
Foundry steel, 2 ft & under	62.00 to 63.00
No. 1 RR. heavy melting	70.00 to 71.00
Rails 2 ft and under	84.00 to 85.00
Rails 18 in. and under	85.00 to 86.00
Railroad grate bars	49.00 to 50.00
Steel axle turnings	44.00 to 45.00
Railroad cast	61.00 to 62.00
No. 1 machinery cast	60.00 to 61.00
Stove plate	54.00 to 55.00
Malleable	71.00 to 72.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$67.00 to $68.00
No. 2 hvy. melting	59.00 to 60.00
No. 1 bundles	66.50 to 67.50
No. 2 bundles	51.00 to 52.00
Machine shop turn.	35.00 to 36.00
Shoveling turnings	41.00 to 42.00
Cast iron borings	40.00 to 41.00
Low phos. plate	70.00 to 71.00

Buffalo

No. 1 hvy. melting	$60.00 to $61.00
No. 2 hvy. melting	50.00 to 51.00
No. 1 busheling	60.00 to 61.00
No. 1 bundles	60.00 to 61.00
No. 2 bundles	45.00 to 46.00
Machine shop turn.	34.00 to 35.00
Mixed bor. and turn.	38.00 to 39.00
Shoveling turnings	37.00 to 38.00
Cast iron borings	35.00 to 36.00
Low phos. plate	65.00 to 66.00
Scrap rails, random lgth.	63.00 to 64.00
Rails 2 ft and under	79.00 to 80.00
RR. steel wheels	65.00 to 66.00
RR. spring steel	60.00 to 61.00
RR. couplers and knuckles	74.00 to 75.00
No. 1 machinery cast	54.00 to 55.00
No. 1 cupola cast	48.00 to 49.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$59.00 to $60.00
No. 2 hvy. melting	50.00 to 51.00
No. 1 bundles, openhearth	60.00 to 61.00
No. 2 bundles	40.00 to 41.00
New busheling	59.00 to 60.00
Drop forge flashings	58.50 to 59.50
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	32.00 to 33.00
Low phos. punch'gs, plate	59.00 to 60.00
No. 1 cupola cast	51.00 to 52.00
Heavy breakable cast	44.00 to 45.00
Stove plate	45.00 to 46.00
Automotive cast	54.00 to 55.00

St. Louis

No. 1 hvy. melting	$55.00 to $56.00
No. 2 hvy. melting	48.00 to 49.00
No. 1 bundles	58.00 to 59.00
No. 2 bundles	44.00 to 45.00
Machine shop turn.	39.00 to 40.00
Cast iron borings	41.00 to 42.00
Shoveling turnings	41.00 to 42.00
No. 1 RR. hvy. melting	66.00 to 67.00
Rails, random lengths	82.00 to 83.00
Rails 18 in. and under	86.00 to 87.00
Locomotive tires uncut	68.00 to 69.00
Angles and splice bars	70.00 to 71.00
Std. steel car axles	84.00 to 85.00
RR. specialties	71.50 to 72.50
Cupola cast	51.00
Heavy breakable cast	46.50 to 47.50
Cost iron brake shoes	54.00 to 55.00
Stove plate	44.00 to 45.00
Cast iron car wheels	56.00 to 57.00
Rerolling rails	88.00 to 89.00
Unstripped motor blocks	45.50 to 46.50

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$54.00 to $55.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles	54.00 to 55.00
No. 2 bundles	40.50 to 41.50
No. 1 busheling	54.00 to 55.00
Elec. furnace, 3 ft & under	56.00 to 57.00
Machine shop turn.	32.00 to 33.00
Mixed bor. and short turn.	34.00 to 35.00
Shoveling turnings	37.00 to 38.00
Clean cast chem. borings	37.00 to 38.00
No. 1 machinery cast	47.00 to 48.00
Mixed cupola cast	43.00 to 44.00
Heavy breakable cast	45.00 to 46.00
Stove plate	41.00 to 42.00
Unstripped motor blocks	33.00 to 34.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$57.00 to $58.00
No. 2 hvy. melting	49.00 to 50.00
No. 2 bundles	47.00 to 48.00
Machine shop turn.	37.00 to 38.00
Mixed bor. and turn.	41.00 to 42.00
Shoveling turnings	42.00 to 43.00
Clean cast chem. borings	35.00 to 36.00
No. 1 machinery cast	52.00 to 53.00
Mixed yard cast	47.00 to 48.00
Charging box cast	50.00 to 51.00
Heavy breakable cast	50.00 to 51.00
Unstripped motor blocks	40.00 to 41.00

Birmingham

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	38.00 to 39.00
No. 1 busheling	46.00 to 47.00
Machine shop turn.	36.00 to 37.00
Shoveling turnings	37.00 to 38.00
Cast iron borings	27.00 to 28.00
Electric furnace bundles	54.00 to 55.00
Bar crops and plate	60.00 to 61.00
Structural and plate, 2 ft	59.00 to 60.00
No. 1 RR hvy. melting	61.00 to 62.00
Scrap rails, random lgth.	69.00 to 70.00
Rails, 18 in. and under	74.00 to 75.00
Angles & splice bars	66.00 to 67.00
Rerolling rails	80.00 to 81.00
No. 1 cupola cast	52.00 to 53.00
Stove plate	51.00 to 52.00
Charging box cast	40.00 to 41.00
Cast iron car wheels	45.00 to 46.00
Unstripped motor blocks	44.00 to 45.00
Mashed tin cans	15.00 to 16.00
Elec. furnace, 3 ft & under	52.00 to 53.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$62.00 to $63.00
No. 2 hvy. melting	52.00 to 53.00
No. 1 bundles	62.00 to 63.00
No. 2 bundles	46.00 to 47.00
Machine shop turn.	40.00 to 41.00
Mixed bor. and turn.	40.00 to 41.00
Shoveling turnings	43.00 to 44.00
Cast iron borings	40.00 to 41.00
Low phos. 18 in. & under	69.00 to 70.00
Rails, random lengths	76.00 to 77.00
Rails, 18 in. and under	82.00 to 83.00
No. 1 cupola cast	48.00 to 49.00
Hvy. breakable cast	47.00 to 48.00
Drop broken cast	59.00 to 60.00

San Francisco

No. 1 hvy. melting	$55.00
No. 2 hvy. melting	52.00
No. 1 bundles	54.00
No. 2 bundles	40.00
Machine shop turn.	35.00
Cast iron borings	35.00
No. 1 RR. hvy. melting	55.00
No. 1 cupola cast	57.00

Los Angeles

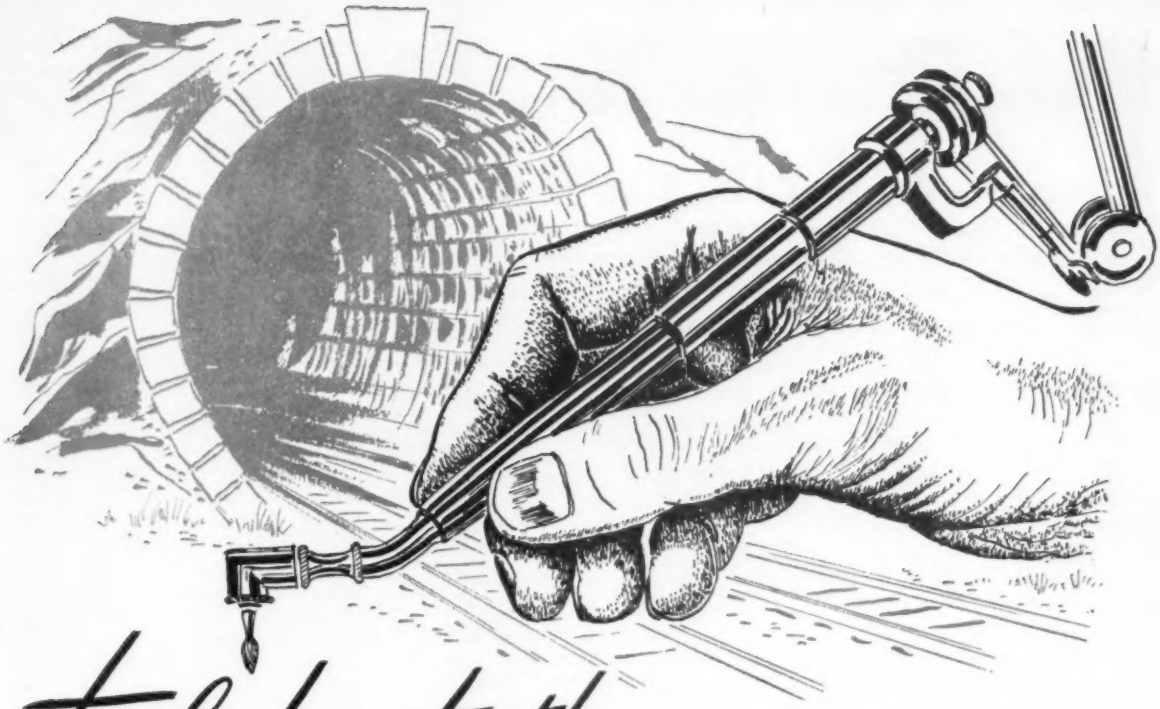
No. 1 hvy. melting	$54.00
No. 2 hvy. melting	52.00
No. 1 bundles	53.00
No. 2 bundles	38.00
Machine shop turn.	35.00
Shoveling turnings	38.00
Cast iron borings	35.00
Elec. furn. 1 ft and under (foundry)	66.00
No. 1 RR. hvy. melting	54.00
No. 1 cupola cast	56.00

Seattle

No. 1 hvy. melting	$54.00
No. 2 hvy. melting	51.00
No. 2 bundles	$33.00 to 35.00
No. 1 cupola cast	55.00
Mixed yard cast	55.00

Hamilton, Ont.

No. 1 hvy. melting	$52.00
No. 2 hvy. melting	47.00
No. 1 bundles	52.00
No. 2 bundles	40.50
Mixed steel scrap	46.00
Bushelings	39.50
Bush., new fact., prep'd	50.00
Bush., new fact., unprep'd	46.00
Machine shop turn.	31.00
Short steel turn.	35.00
Mixed bor. and turn.	28.00
Rails, rerolling	60.00
Cast scrap	50.00



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Tools for teeth or tunnels, for mines, mills or military—today's demands require steel in unfailing quantity, of predictable quality and performance. To satisfy these demands, the supply of scrap must be continuously maintained.

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Alumina-From-Clay Debated

Bureau of Mines Director calls Anaconda project a step forward . . . Cites Bureau experiment . . . Aluminum producers object . . . Will continue to depend on bauxite.

◆MARLING J. ANKENY, Director of the Bureau of Mines, had some good words to say for the Anaconda alumina-from-clay project. But it is doubtful that it made any of the skeptics change their minds.

Speaking before the Northwest Mining Assn., Mr. Ankeny called the Anaconda move a definite step forward for aluminum producers. The reason: they are now almost completely dependent on imported bauxite.

He pointed out that in 1950 the Bureau of Mines had produced 800 tons of alumina from anorthosite clay at Laramie, Wyo. The Bureau considers this experiment a definite indication that a lime-soda sinter process is technically and commercially feasible.

The reaction of other aluminum producers is still skeptical. "Imported" bauxite for production of alumina in this country comes almost exclusively from the Carribean area. Producers agree that technically speaking this is importing. But practically, it is easier and cheaper than transportation would be from many parts of the U. S. And there is no duty to pay.

As for the claim that war would cut off their supply, producers point out that even the active Nazi U-boat packs were not able to make any noticeable dent in the supply during World War II.

General conclusions: Anaconda, as a newcomer in the field of aluminum production, cannot acquire proximate sources of high grade bauxite. The only question is whether it is cheaper to buy the ore or gamble on a new and untried process.

Anaconda, with major expansion in mind, does not want to be entirely dependent on another company for its supplies.

One major producer claims it's cheaper to go half way around the world for bauxite than to extract alumina from clay.

ALUMINUM . . . An important and unpublicized reason the Russians decided not to leave Hungary is the fact that Hungarian bauxite reserves are the richest in Europe. They are among the highest commercial grades, superior to anything Russia is known to possess. USSR aluminum industry could not have taken this loss without dropping both quality and quantity.

Hungarian deposits are estimated at about 300 million tons of bauxite. Most of this is located in an area called Pecs, about 125 miles south of Budapest.

MAGNESIUM . . . Primary ingot production during October topped both September, 1956, and October, 1955, Magnesium Assn. says.

Total of 6735 tons turned out was 9 pct over the 6128 tons produced in September and 7 pct over the 6286 tons made in October, 1955.

The Magnesium Assn. reports that on the basis of 10 month totals, output for the year should hit about 68,000 tons.

Shipments of wrought products reflected a recent strike. The 431 tons shipped was below the previous month's pace of 994 tons. The Assn. expects November and December to be back in the groove and make shipments for the year an all-time record.

TITANIUM . . . Titanium Metals Corp. of America started the ball rolling by dropping the price for mill products from 6 to 8 pct. Other producers followed. And the Titanium Producers and Fabricators Industry Advisory Committee said that the industry would be able to meet the anticipated increased requirements of defense contractors.

The price reduction, second during 1956, reduced the price of sheet by $1.00 per lb.; strip by $1.10; plate by 75¢; bar and billet from 55¢ to 75¢ per lb.; and wire as much as $2.00.

COPPER . . . Although the market was relatively colorless this week, it did have its ups and downs. Brass mill prices were up. Custom smelters copper price showed indication of going down.

Revere Copper & Brass Co., Inc., made the first move by increasing price of some mill products ½ to 1¢ per lb., effective Nov. 30. Reason given was the additional costs caused by new labor contracts. Within 24 hours all of the major mills had gone along, effective Dec. 3.

Price of custom smelter copper is still unsure. During the week one company dropped the price ½¢ per lb to 35.50¢. Some followed.

Tin prices for the week: Nov. 28—110.50; Nov. 29—110.75; Nov. 30—110.875; Dec. 3—110.75; Dec. 4—110.50.*

* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum ingot	27.10	25.90	8/10/56
Aluminum pig	25.00	24.00	8/10/56
Copper (E)	38.00	40.00	10/26/56
Copper (CS)	35.75	36.00	11/24/56
Copper (L)	36.00	40.00	10/27/56
Lead, E. St. L.	15.80	15.30	1/13/56
Lead, N. Y.	16.00	15.50	1/13/56
Magnesium ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	84.50	80.00	11/24/54
Titanium sponge	270-300	295-325	7/7/56
Zinc, E. St. L.	13.50	13.00	1/6/56
Zinc, N. Y.	14.00	13.50	1/6/56

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see column at right, other primary prices, pg. 188.

Monthly Average Metal Prices

(Cents per lb except as noted)

Average prices of the major nonferrous metals in November based on quotations appearing in THE IRON AGE, were as follows.

Electrolytic copper, del'd Conn Valley	36.00
Copper, Lake	36.00
Straits Tin, New York	110.908
Zinc, E. St. Louis	13.50
Lead, St. Louis	15.80
Aluminum ingot, frt allw'd	27.10

Note: Quotations are going prices



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Nonferrous Prices *(Effective Dec. 4, 1956)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136–.249	.250–3.
1800, 1100, 3003	44.3	42.1	40.9	40.2
5052	51.8	46.8	45.1	42.9
6061-0	48.9	44.6	42.8	42.6

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6 8	45.5–47.3	61.3–65.1
12 16	46.2–47.7	62.2–66.8
24 26	49.4–49.5	73.1–77.8
36 38	58.3–59.9	97.4–101 0

Screw Machine Stock—2011-T-3

Size*	¼	⅜–⅝	⅞–1	1¼–1½
Price	59.7	58.8	57.4	55.2

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.352	$1.803	$2.254	$2.704
.024 gage	1.686	2.252	2.815	3.378

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	....	93 3	95.7	10s 7	171 3
Tread Plate	....	70 6	71.7	.....	...
Tooling Plate	73 0	.....	.....	.....	

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69 6	70 7	75.6	89 3
Spec. Grade (AZ31B)	84.6	85.7	90 6	104 3

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	113	97	118
Strip, CR	111	99	128
Rod, bar, HR	94	80	99
Angles, HR	94	80	99
Plates, HR	107	96	111
Seamless tube	144	120	190
Shot, blocks	...	78	...

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.63	.....	54.86	57.82
Brass, 70/30	49.44	49.98	49.37	52.35
Brass, Low	52.65	53.19	52.59	55.46
Brass, R L	53.79	54.33	53.73	56.60
Brass, Naval	53.39	.....	47.70	56.55
Munts Metal	51.44	.....	47.25	.....
Comm. Bs.	55.48	56.02	55.42	58 04
Mang. Bs.	57.13	.....	51.23	.....
Phos. Bs. 5%	76.25	.....	76.75	.....

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $11.00-$12.10; alloy, $14.75; Plate, HR, commercially pure, $9.25-$9.75; alloy, $11.25. Wire, rolled and/or drawn, commercially pure, $8.50-$9.00; alloy, $11.00; Bar, HR or forged, commercially pure, $7.10-$7.35; alloy, $7.10-$7.30; billets, HR, commercially pure, $6.85-$7.10; alloy, $6.85-$7.05.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex... 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, small lots ..... $ 4.55
Chromium, 99.8% metallic basis.... $ 1.31
Cobalt, 97-99% (per lb).... $2.35 to $2.42
Germanium, per gm, f.o.b. Miami, Okla., refined $48.50
Gold, U. S. Treas., per troy oz.... $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz.... $90 to $100
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $255 to $257
Nickel oxide sinter at Copper Cliff, Ont., contained nickel..... 60.75
Palladium, dollars per troy oz. $23 to $24
Platinum, dollars per troy oz..$103 to $105
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.)..... 91.375
Thorium, per kg $43.00
Uranium, normal per kg $40.00
Vanadium ..... $ 3.45
Zirconium sponge $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 35.00
No. 120 ..... 33.75
No. 123 ..... 32.25
80-10-10 ingot
No. 305 ..... 38.50
No. 315 ..... 36.75
88-10-2 ingot
No. 210 ..... 48.75
No. 215 ..... 44.50
No. 245 ..... 40.00
Yellow ingot
No. 405 ..... 27.50
Manganese bronze
No. 421 ..... 30.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 26.25-27.00
0.60 copper max. 26.00-26.75
Piston alloys (No. 122 type)..26.00-26.75
No. 12 alum. (No. 2 grade) ...23.75-25.00
108 alloy 24.00-25.00
195 alloy 26.50-27.00
13 alloy (0.60 copper max.) ...26.00-26.75
AXS-679 ..... 24.00-25.00

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 24.00-25.50
Grade 2—92-95% 23.25-24.50
Grade 3—90-92% 22.50-23.75
Grade 4—85-90% 21.75-22.75

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	32	31¼
Yellow brass	24⅝	22⅝
Red brass	28½	27⅜
Comm. bronze	29½	28¾
Mang. bronze	23½	22¼
Yellow brass rod ends	24⅝	....

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 30¾
No. 2 copper wire 29¼
Light copper 27
*Refinery brass 27¾
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 30¾
No. 2 copper wire 29¼
Light copper 27
No. 1 composition 27½
No. 1 comp. turnings 27
Hvy. yellow brass solids..... 20½
Brass pipe 20½
Radiators 22
Aluminum
Mixed old cast. ..... 16½—17½
Mixed new clips ..... 17 —18
Mixed turnings, dry ..... 16½—17

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 27½—28
No. 2 copper wire ..... 26 —26½
Light copper ..... 23½—24
Auto radiators (unsweated) .. 17½—18
No. 1 composition ..... 24 —24½
No. 1 composition turnings... 22½—23
Cocks and faucets ..... 18½—19
Clean heavy yellow brass.... 16 —16½
Brass pipe ..... 19 —19½
New soft brass clippings .... 21 —21½
No. 1 brass rod turnings..... 18 —18½

Aluminum

Alum. pistons and struts..... 6½— 7
Aluminum crankcases ..... 12 —12½
1100 (2S) aluminum clippings 15 —15½
Old sheet and utensils ..... 12 —12½
Borings and turnings ..... 8½— 9
Industrial castings ..... 12 —12½
2024 (24S) clippings ..... 13½—14

Zinc

New zinc clippings ..... 7 — 7½
Old zinc ..... 4½— 5
Zinc routings ..... 2¾— 3
Old die cast scrap ..... 2½— 2¾

Nickel and Monel

Pure nickel clippings..... $1.75-$1.85
Clean nickel turnings ..... $1.50-$1.60
Nickel anodes ..... $1.75-$1.85
Nickel rod ends ..... $1.75-$1.85
New Monel clippings 75-80
Clean Monel turnings 70-75
Old sheet Monel 70-80
Nickel silver clippings, mixed 21
Nickel silver turnings, mixed 18

Lead

Soft scrap lead ..... 12½—13
Batt-ry plates (dry) ..... 7 — 7¼
Batteries, acid free 4½

Miscellaneous

Block tin ..... 80 —81
No. 1 pewter ..... 62½—63
Auto babbitt ..... 42 —42½
Mixed common babbitt ..... 13 —13½
Solder joints ..... 18 —18½
Siphon tops 42
Small foundry type ..... 15¼—15½
Monotype ..... 14½—15
Lino. and stereotype ..... 13 —13½
Electrotype ..... 12½—12¾
Hand picked type shells ..... 10 —10½
Lino. and stereo. dross ..... 5¼— 5¾
Electro. dross ..... 4¼— 4½

STEEL PRICES

(Effective Dec. 4, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$107.00 *B3*		5.05 *B3*	7.40 *B3*	5.05 *B3*						
	Buffalo, N. Y.	$74.00 *B3, R3*	$91.50 *B3, R3*	$107.00 *B3, R3*	5.90 *B3*	5.05 *B3*	7.40 *B3*	5.05 *B3*	4.675 *B3, R3*	6.85 *R7*	6.95 *B3*			
	Claymont, Del.													
	Harrison, N. J.													14.55 *C11*
	Conshohocken, Pa.		$96.50 *A2*	$114.00 *A2*					4.725 *A2*	6.90 *A2*	6.95 *A2*			
	New Bedford, Mass.									7.30 *R6*				
	Johnstown, Pa.	$74.00 *B3*	$91.50 *B3*	$107.00 *B3*		5.05 *B3*	7.40 *B3*							
	Boston, Mass.									7.40 *T8*				14.90 *T8*
	New Haven, Conn.									7.30 *D1*				
	Baltimore, Md.									6.85 *T8*				
	Phoenixville, Pa.					5.85 *P2*		5.85 *P2*						
	Sparrows Pt., Md.								4.675 *B3*		6.95 *B3*			
	Bridgeport, Wallingford, Conn.	$79.00 *N8*	$96.50 *N8*	$107.00 *N8*						7.30 *W1* 6.95 *N8*				
	Pawtucket, R. I. Worcester, Mass.									7.48 *A5,N7*				14.90 *N7*
MIDDLEWEST	Alton, Ill.								4.875 *L1*					
	Ashland, Ky.								4.675 *A7*					
	Canton-Massillon, Dover, Ohio		$94.00 *R3*	$107.00 *R3, T5*						6.85 *G4*		10.10 *G4*		14.55 *G4*
	Chicago, Ill. Franklin Park, Ill.	$74.00 *U1, R3*	$91.50 *U1, R3,W8*	$107.00 *U1, R3,W8*	5.90 *U1*	5.00 *U1, W8*	7.35 *U1,Y1* 6.00 *W8*	5.00 *U1*	4.675 *N4* 4.675 *A1*	6.95 *A1,T8*			7.75 *W8 S9*	14.55 *A1, S9,T8*
	Cleveland, Ohio									6.85 *A5,J3*			7.75 *J3*	
	Detroit, Mich.	$74.00 *R5*		$107.00 *R5*					4.775 *G3, M2*	6.95 *M2,G3, D2,P11*	7.05 *G3*	10.10 *G3, S1,D2*	7.05 *G3*	
	Anderson, Ind.									6.85 *G4*		10.10 *G4*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$74.00 *U1*	$91.50 *U1*	$107.00 *U1, Y1*	5.90 *I3*	5.00 *U1*	7.35 *U1,I3*	5.00 *I3*	4.675 *U1, I3,Y1*	5.85 *Y1*	6.95 *U1, I3,Y1*	10.20 *Y1*	7.75 *U1, Y1*	
	Sterling, Ill.	$74.00 *N4*							4.775 *N4*					
	Indianapolis, Ind.									7.90 *C5*				
	Newport, Ky.												7.75 *N5*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$91.50 *S1, C10*	$107.00 *S1, C10*					4.675 *S1, R3*	6.85 *T4*	6.95 *S1, R3*	10.00 *S1, R3*	7.75 *S1*	14.55 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$74.00 *U1, J3*	$91.50 *U1, J3,C11*	$107.00 *U1, C11*	5.90 *U1*	5.00 *U1, J3*	7.35 *U1, J3*	5.00 *U1*	4.675 *P6*	5.750 *P6* 6.85 *J3,B4, S7*			7.75 *S9*	14.55 *S9*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					5.00 *W3*			4.675 *W3*	6.85 *W3,F3*	6.95 *W3*	9.65 *W3*		
	Youngstown, Ohio	$74.00 *R3*	$91.50 *Y1, C10*	$107.00 *Y1*		5.00 *Y1*	7.35 *Y1*		4.675 *U1, Y1*	6.85 *Y1,C5*	6.95 *U1, Y1*	10.20 *Y1*	7.75 *U1, Y1*	
WEST	Fontana, Cal.	$83.50 *K1*	$101.00 *K1*	$128.00 *K1*		5.70 *K1*	8.05 *K1*	5.85 *K1*	5.475 *K1*	6.50 *K1*				
	Geneva, Utah	$91.50 *C7*				5.00 *C7*	7.35 *C7*							
	Kansas City, Mo.					5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			
	Los Angeles, Torrance, Cal.		$101.00 *B2*	$127.00 *B2*		5.70 *C7, B2*	8.05 *B2*		5.425 *B2, C7*	8.80 *C1*			8.95 *B2*	
	Minnequa, Colo.					5.30 *C6*			5.775 *C6*					
	Portland, Ore.					5.75 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$101.00 *B2*			5.65 *B2*	8.00 *B2*		5.425 *C7,B2*					
	Seattle, Wash.		$105.00 *B2*			5.75 *B2*	8.10 *B2*		5.675 *B2*					
SOUTH	Atlanta, Ga.								4.875 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$74.00 *T2*	$91.50 *T2*			5.00 *T2,R3* 5.30 *C16*	7.35 *T2*		4.675 *T2,R3* 4.975 *C10*		6.95 *T2*			
	Houston, Lone Star, Texas	$80.00 *L3*	$96.50 *S2*	$112.00 *S2*		5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			

STEEL PRICES

(Effective Dec. 4, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.675 *B3*	5.75 *B3*				6.90 *B3*	8.525 *B3*			5.80 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price, Can-making quality blackplate 55 to 128 lb. deduct .2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.725 *A2*	5.80 *A2*				6.95 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.80 *B3*			
	Fairless, Pa.	4.725 *U1*	5.80 *U1*				6.95 *U1*	8.575 *U1*				$9.80 *U1*	$8.50 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.675 *B3*	5.75 *B3*	6.30 *B3*			6.90 *B3*	8.575 *B3*	9.275 *B3*		5.90 *B3*	$9.80 *B3*		
	Worcester, Mass.										6.10 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.00 *L1*			
	Ashland, Ky.	4.675 *A7*		6.30 *A7*	6.325 *A7*									
	Canton-Massillon, Dover, Ohio			6.30 *R3,R1*										
	Chicago, Joliet, Ill.	4.675 *W8, A1*					6.90 *U1*			5.80 *K2*	5.80 *A5,R3, N4,W8, K2*			
	Sterling, Ill.										5.90 *N4, K2*			
	Cleveland, Ohio	4.675 *J3, R3*	5.75 *J3, R3*		6.325 *R3*		6.90 *R3*	8.525 *R3, J3*			5.80 *A5*			
	Detroit, Mich.	4.775 *G3, M2*	5.85 *G3* 5.75 *M2*				7.00 *G2*	8.625 *G3*						
	Newport, Ky.	4.675 *A9*	5.75 *A9*											
	Gary, Ind. Harbor, Indiana	4.675 *U1, I3,Y1*	5.75 *U1, I3,Y1*	6.30 *U1, I3*	6.325 *U1, I3,Y1*	6.70 *U1*	6.90 *U1, Y1,I3*	8.525 *U1, Y1*			5.80 *Y1*	$9.70 *U1, Y1*	$8.40 *I3, U1,Y1*	7.15 *U1, Y1*
	Granite City, Ill.	4.875 *G2*	5.95 *G2*	6.50 *G2*	6.525 *G2*								$8.50 *G2*	7.25 *G2*
	Kokomo, Ind.			6.40 *C9*							5.90 *C9*			
	Mansfield, Ohio		5.75 *E2*			6.70 *E2*								
	Middletown, Ohio		5.75 *A7*	6.30 *A7*	6.325 *A7*	6.70 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.675 *S1, R3,N3*	5.75 *R3*	6.30 *R3*	6.325 *N3*	6.70 *N3*	6.90 *S1, R3*	8.525 *S1, R3*					$8.40 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.675 *U1, J3,P6*	5.75 *U1, J3,P6*	6.30 *U1, J3*	6.325 *U1*		6.90 *U1, J3,R3*	8.525 *U1, J3*	9.275 *U1*		5.80 *A5, P6,J3*	$9.70 *J3, U1*	$8.40 *U1*	7.15 *U1*
	Portsmouth, Ohio	4.675 *P7*	5.75 *P7*								5.80 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.675 *W3, W5*	5.75 *W3, W5,F3*	6.30 *W3, W5*		6.70 *W3, W5*	6.90 *W3*	8.525 *W3*				$9.60 *W5*	$8.30 *W5*	7.15 *W5* 7.40 *W3*
	Youngstown, Ohio	4.675 *U1, Y1*	5.75 *Y1*		6.325 *Y1*		6.90 *Y1*	8.525 *Y1*			5.80 *Y1*			7.15 *Y1*
WEST	Fontana, Cal.	5.475 *K1*	6.95 *K1*				7.70 *K1*	9.725 *K1*				$10.35 *K1*	$9.05 *K1*	
	Geneva, Utah	4.775 *C7*												
	Kansas City, Mo.										6.05 *S2*			
	Los Angeles, Terrance, Cal.										6.60 *B2*			
	Minnequa, Colo.										6.05 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.375 *C7*	6.70 *C7*	7.05 *C7*							6.45 *C7*	$10.45 *C7*	$9.15 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.675 *T2, R3*	5.75 *T2,*	6.30 *T2, R3*							5.80 *T2,R3*	$9.80 *T2*	$8.50 *T2*	
	Houston, Tex.										6.05 *S2*			

IRON AGE

STEEL PRICES

(Effective Dec. 4, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem				6.125 *B3*	8.325 *B3*	7.40 *B3*					
	Buffalo, N. Y.	5.075 *B3,R3*	5.075 *B3,R3*	6.90 *B5*	6.125 *B3,R3*	8.325 *B5,B3*	7.40 *B3*	4.85 *B3*				7.20 *W6*
	Claymont, Del.							5.35 *C4*		6.85 *C4*	7.55 *C4*	
	Conshohocken, Pa.							5.25 *L4*		6.85 *L4*	7.55 *L4*	
	Coatesville, Pa.							4.90 *A2*	5.925 *A2*	6.25 *A2*	7.25 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *C3*			
	Hartford, Conn.			7.35 *R3*		8.625 *R3*	7.40 *B3*					
	Johnstown, Pa.	5.075 *B3*	5.075 *B3*		6.125 *B3*			4.85 *B3*		6.85 *B3*	7.25 *B3*	7.20 *B3*
	Fairless, Pa.	5.225 *U1*	5.225 *U1*		6.275 *U1*							
	Newark, N. J.			7.30 *W10*		8.50 *W10*						
	Camden, N. J.			7.30 *P10*		8.50 *P10*						
	Bridgeport, Conn. Putnam, Conn.	5.30 *N8*	5.30 *N8*	7.20 *N8* 7.40 *W10*	6.20 *N8*	8.475 *N8*	7.50 *N8*					
	Sparrows Pt., Md.		5.075 *B3*					4.85 *B3*		6.85 *B3*	6.85 *B3*	7.30 *B3*
	Palmer, Worcester, Readville, Mass. Milton, Pa.	5.225 *M7*	5.225 *M7*	7.40 *B5,C14*		8.325 *A5* 8.625 *B5*						7.50 *A5,W6* 9.025 *T8*
	Spring City, Pa.			7.30 *K4*		8.50 *K4*						
MIDDLE WEST	Alton, Ill.	5.275 *L1*										7.40 *L1*
	Ashland, Newport, Ky.							4.85 *A7,N5*		6.85 *N5*		
	Canton, Massillon, Ohio			6.85 *R3,R2*	6.125 *R3,T5*	8.325 *R3,R2, T5*						
	Chicago, Joliet, Ill.	5.075 *U1,R3, W8,N4* 5.575 *P13*	5.075 *U1,R3, N4* 5.575 *P13*	6.85 *A5,B5, W10,L2 W8,L2,N9*	6.125 *U1,R3, W8*	8.325 *A5,B5, W8,L2,N9, W10*	5.875 *W8*	4.85 *U1,I3, W8,A1*	5.925 *U1*	6.85 *U1,W8*	7.25 *U1*	7.20 *A5,K2, R3,N4,W7*
	Cleveland, Ohio	5.075 *R3*	5.075 *R3*	6.85 *A5,C13*		8.325 *A5,C13*	7.425 *R3*	4.95 *J3,R3*	5.925 *J3*		7.25 *J3,R3*	7.20 *A5, C13*
	Detroit, Mich.	5.175 *G3*	5.425 *G3*	7.05 *B5,P8* 7.10 *P3* 6.85 *R5*	6.225 *G3* 6.125 *R5*	8.525 *B5,P3, P8* 8.325 *R5*	7.525 *G3*	4.95 *G3*		6.90 *G3*		
	Duluth, Minn.											7.20 *A5*
	Gary, Ind. Harbor, Crawfordsville	5.075 *U1,I3, Y1*	5.075 *U1,I3, Y1*	6.85 *R3,M5*	6.125 *U1,I3, Y1*	8.325 *R3,M4*	7.425 *U1,I3, Y1*	4.85 *U1,I3, Y1*	5.925 *I3*	6.85 *U1,Y1*	7.25 *U1,Y1*	7.30 *M4*
	Granite City, Ill.							5.05 *G2*				
	Kokomo, Ind.											7.30 *C9*
	Sterling, Ill.	5.525 *N4*	5.175 *N4*									7.30 *K2*
	Niles, Warren, Ohio Sharon, Pa.			6.85 *C10*	6.125 *C10,S1*	8.325 *C10*	7.425 *S1*	4.85 *S1,R3*		6.85 *S1*	7.25 *S1,R3*	
	Pittsburgh, Pa. Midland, Pa.	5.075 *U1, C11,J3*	5.075 *U1,J3*	6.85 *A5,C8, J3, R3, S9, B4,W10*	6.125 *U1,C11*	8.325 *A5,R3, S9,C8,W10, C11*	7.425 *U1,J3*	4.85 *U1,J3*	5.925 *U1*	6.85 *U1,J3*	7.25 *U1,J3*	7.20 *A5,J3, P6*
	Portsmouth, Ohio											7.20 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							4.85 *W5*				
	Youngstown, Ohio	5.075 *U1, Y1,R3*	5.075 *U1, Y1,R3*	6.85 *U1,Y1, F2*	6.125 *U1,Y1*	8.325 *Y1,F2*	7.425 *U1,Y1*	4.85 *U1,Y1, R3*		6.85 *Y1*	7.25 *Y1*	7.20 *Y1*
WEST	Emeryville, Cal.	5.825 *J5*	5.825 *J5*									
	Fontana, Cal.	5.775 *K1*	5.775 *K1*		7.175 *K1*		8.125 *K1*	5.55 *K1*		7.55 *K1*	7.95 *K1*	
	Geneva, Utah	5.175 *C7*						4.85 *C7*			7.25 *C7*	
	Kansas City, Mo.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*					7.45 *S2*
	Los Angeles, Torrance, Cal.	5.775 *C7,B2*	5.775 *C7,B2*	8.30 *R3*	7.175 *B2*		8.125 *B2*					8.15 *B2*
	Minnequa, Colo.	5.525 *C6*	5.525 *C6*					5.70 *C6*				7.45 *C6*
	Portland, Ore.	5.825 *O2*	5.825 *O2*									
	San Francisco, Niles, Pittsburgh, Cal.	5.775 *C7,P9* 5.825 *B2*	5.775 *C7,P9* 5.825 *B2*				8.175 *B2*					8.15 *C7,C6*
	Seattle, Wash.	5.825 *B2* 5.825 *N6*	5.825 *B2*				8.175 *B2*	5.75 *B2*		7.75 *B2*	8.15 *B2*	
SOUTH	Atlanta, Ga.	5.575 *A8*										7.40 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.075 *T2,R3* 5.375 *C16*	5.075 *T2,R3* 5.375 *C16*				7.425 *T2*	4.85 *T2,R3*			7.25 *T2*	7.20 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.325 *S2*	5.325 *S2*	[illegible]	6.375 *S2*		7.675 *S2*	4.95 *S2* 5.20 *L3*		6.95 *S2*	7.35 *S2*	7.45 *S2*

† Merchant Quality—Specialty Quality .35¢ higher.

Steel Prices *(Effective Dec. 4, 1956)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Disston Div., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Stee Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Dearborn Div., Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal
Sparrows Pt. *B3*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75								
Youngstown *R3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Fontana *K1*	0.00	+15.25	3.00	+11.25	5.50	+7.75	8.00	+7.00	8.50	+6.00	9.00	+5.50	10.50	+5.75								
Pittsburgh *J3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Alton, Ill. *L1*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75								
Sharon *M3*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Fairless *N2*	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75								
Pittsburgh *N1*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Wheeling *W5*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Wheatland *W4*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75								
Youngstown *Y1*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
Indiana Harbor *Y1*	11.50	+5.75	14.50	1.25	17.00	3.75	19.50	4.50	20.00	5.50	20.50	6.00	22.00	5.75								
Lorain *N2*	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75								
Youngstown *R3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75								
Fairless *N2*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75								
Fontana *K1*	4.50		8.50		10.50		11.00		11.50		12.00		12.50									
Pittsburgh *J3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Alton, Ill. *L1*	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75								
Sharon *M3*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75								
Pittsburgh *N1*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Wheeling *W5*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75								
Wheatland *W4*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75								
Youngstown *Y1*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25
Indiana Harbor *Y1*	16.00	2.25	20.00	6.25	22.00	9.75	22.50	8.50	23.00	9.50	23.50	10.00	22.00	8.75								
Lorain *N2*	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½" and 3" pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.68	T-1
18	4	1	—	5	2.385	T-4
18	4	2	—	—	1.845	T-2
1.5	4	1.5	8	—	1.04	M-1
6	4	3	6	—	1.43	M-3
6	4	2	5	—	1.185	M-2

High-carbon chromium	.83 D-3, D-5
Oil hardened manganese	.45 O-2
Special carbon	.41 W-1
Extra carbon	.345 W-1
Regular carbon	.29 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b

	Cladding	Plate (A3, J2, L4) 10 pct	Plate (A3, J2, L4) 15 pct	Plate (A3, J2, L4) 20 pct	Sheet (I2) 20 pct
Stainless Type	302	.....	.....	.....	33.25
	304	34.60	38.00	41.50	35.25
	316	39.70	43.20	46.65	52.25
	321	36.35	39.80	43.50	42.00
	347	39.50	43.95	48.45	51.00
	405	29.20	33.15	37.05	.....
	410, 430	28.70	32.65	36.55	.....

CR Strip (89) Copper, 10 pct, 2 sides, 40.65; 1 side, 23.40.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	9.00	9.20	.....
Armature	10.35	10.35	10.85
Elect.	11.00	11.025	11.525
Motor	12.05	12.075	12.575
Dynamo	13.05	13.05	13.55
Trans. 72	14.05	14.05	14.55
Trans. 65	14.60	Grain Oriented	
Trans. 58	15.10	Trans. 80	18.50
Trans. 52	16.15	Trans. 73	19.00

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3) (20¢ higher, HR); Zanesville, Butler (A7).

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1956 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.10
Old range, bessemer	11.25
Old range, nonbessemer	11.10
Mesabi, bessemer	11.00
Mesabi, nonbessemer	10.85
High phosphorus	10.85

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'd ¢/lb.	Merch. Wire Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City R3	167	181	...	195	187	8.10	8.50
Aliquippa, Pa. J3***	164	179	...	...	181	7.95	8.475
Atlanta A8**	166	182	...	192	190	8.05	8.45
Bartonville K2**	166	182	...	192	190	8.05	8.45
Buffalo W6	...	...	...	...	...	8.10	8.50
Chicago, Ill. N4**	164	180	167	190	188	7.95	8.55
Cleveland A6	173	...	...	...	...	8.10	.....
Cleveland A5	...	...	...	...	...	7.95	.....
Crawfordsville M6**	166	182	...	192	190	8.05	8.65
Donora, Pa. A5	164	176	...	190	184	7.95	8.35
Duluth A5	164	176	...	190	184	7.95	8.35
Fairfield, Ala. T2	164	176	...	190	184	7.95	8.35
Galveston D4	180‡	...	...	...	...	...	.....
Houston S2	169	181	...	195	189	8.20	8.60
Johnstown, Pa. B3**	164	180	167	...	188	7.95	8.55
Joliet, Ill. A5	164	176	...	190	184	7.95	8.35
Kokomo, Ind. C9*	166	178	...	192	186	8.05	8.45
Los Angeles B2**	...	...	...	...	...	8.90	9.50
Kansas City S2*	169	181	...	195	189	8.20	8.60
Minnequa C6†	169	181	172	195	189	8.20	8.60
Monessen P6	167	185	...	...	191	8.10	8.10
Pittsburg, Cal. C7	186	199	...	...	204	8.90	9.30
Portsmouth P7	...	...	...	...	...	8.10	.....
Rankin, Pa A5	164	176	...	...	184	7.95	8.35
So. Chicago R3	167	181	...	195	187	8.10	8.50
S. San Francisco C6	...	...	...	214	...	8.90	9.30
Sparrows Pt. B3**	166	...	...	192	190	8.05	8.65
Struthers, O. Y1*	...	...	...	...	...	7.95	8.45
Worcester A5	170	...	...	...	...	8.25	8.65
Williamsport, Pa. S5	...	...	175	...	...	...	.....

* Zinc less than .10¢. † Plus zinc extras.
** 13.5 zinc. ‡ Wholesalers only.
*** .10¢ zinc.

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery ‡ Charge	Sheets: Hot-Rolled 18 ga. & hvr.	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.07	9.27	9.83	8.16	.....	8.40	8.44	8.30	10.14	.....	.....	.....	.....
Baltimore	$.10	7.79	8.99	9.12	8.27	.....	8.12	8.57	8.34	9.09	14.99	14.44	18.39	18.09
Birmingham	.15	7.68	8.88	8.85	7.78	.....	8.01	8.05	7.91	10.04	.....	.....	.....	.....
Boston	.10	8.70–8.86	9.73–9.83	11.02	8.79–8.89	.....	8.98–9.08	8.90–9.00	8.88–8.98	10.71–10.81	15.05	14.45	18.51	18.10
Buffalo	.15	7.90	9.05	10.87	8.15	.....	8.40	8.40	8.15	8.85	15.00	14.45	18.40	.....
Chicago	.15	7.70–7.85	8.90–9.05	9.70	7.78–7.93	.....	8.01–8.16	8.05–8.20	7.91–8.06	8.35–8.50	14.65	14.10	18.05	17.75
Cincinnati	.15	7.97	9.04	9.90	8.21	.....	8.49	8.70	8.34	8.97	14.93	14.38	18.33	18.03
Cleveland	.15	7.68	8.88	9.60	7.88	.....	8.21	8.38	7.99	8.60	14.73	14.18	18.13	17.83
Denver		9.55	11.09	12.41	9.70	.....	9.80	9.60	9.75	10.54	.....	.....	.....	19.79
Detroit	.15	8.06	9.28	10.17	8.25	.....	8.48	8.70	8.33	8.83	.....	14.04	.....	17.09
Houston		8.70	9.65	.....	8.80	.....	8.60	8.90	8.45	10.55	15.50	.....	19.30	19.05
Kansas City	.20	8.52	9.72	10.07	8.60	.....	8.83	8.87	8.73	9.42	15.32	14.77	18.72	18.42
Los Angeles	.10	8.90	10.65	11.65	9.10	.....	9.35	8.95	8.80	11.70	15.85	15.35	19.70	19.45
Memphis	.15	8.02	9.22	.....	8.12	.....	8.35	8.39	8.25	9.85	.....	.....	.....	.....
Milwaukee	.15	7.82	9.02	9.82	7.90	.....	8.13	8.24	8.03	8.57	14.77	.....	18.17	17.87
New York	.10	8.45	9.63	10.33	8.91	.....	8.88	8.84	8.93	10.71	15.02	14.47	18.42	18.12
Norfolk	.20	8.00	.....	.....	8.40	.....	8.35	8.70	8.45	10.70	.....	.....	.....	.....
Philadelphia	.10	7.80–7.99	9.05–9.18	9.66–10.22	8.58–8.68	.....	8.28–8.38	8.38–8.48	8.37–8.47	9.12–9.22	14.80	14.15–14.25	18.20	17.90
Pittsburgh	.15	7.68	8.88	10.05	7.88	.....	8.01	8.20	7.91	8.60	14.65	13.80–14.10	18.05	16.85–17.75
Portland		8.90	9.65	11.40	9.05	.....	8.70	8.90	8.95	13.55	16.70	16.10	20.40	20.25
San Francisco	.10	8.75	10.30	10.80	8.95	.....	8.85	8.85	8.80	12.30	15.85	15.35	19.70	19.45
Seattle		9.35	10.45	11.55	9.50	.....	9.05	9.15	9.30	13.15	16.10	15.55	19.50	19.20
St. Louis	.15	8.02–8.17	9.21–9.49†	10.03–10.18	8.11–8.26	.....	8.34–8.49	8.48–8.63	8.25–8.40	8.93–9.08	14.83–14.98	14.28	18.23–18.38	17.93
St. Paul	.15	8.29	9.64	10.31	8.39	.....	8.71	8.75	8.52	9.21	.....	14.62	.....	18.27

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.
** F.O.B. Plant, warehouse price. † 16 gage. ‡ Deduct for country delivery.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Baltimore, Md. T8	8.25	10.10	12.90	15.30	18.25
Bristol, Conn. W12	.....	.....	12.90	15.30	18.25
Boston T8	8.50	10.10	12.90	15.30	18.25
Buffalo, N. Y. R7	7.95	9.80	12.60	15.00	17.95
Carnegie, Pa. S9	‡	9.80	12.60	15.00	.....
Cleveland A5	7.95	9.80	12.60	15.00	17.95
Detroit D1	8.05	9.90	12.70	15.10	.....
Detroit D2	8.05	9.90	12.70	.....	.....
Dover, O. G4	7.95	9.80	12.60	15.00	17.95
Franklin Park, Ill. T8	8.05	9.80	12.60	15.00	17.95
Harrison, N. J. C11	.....	.....	12.90	15.30	18.25
Indianapolis C5	8.10	9.95	12.60	15.00	17.95
New Castle, Pa. B4	7.95	9.80	12.60	15.00	.....
New Haven, Conn. D1	8.40	10.10	12.90	15.30	.....
Pawtucket, R. I. N7	8.50	10.10	12.90	15.30	18.25
Pittsburgh S7	7.95	9.80	12.60	15.00	17.95
Riverdale, Ill. A1	8.05	9.80	12.60	15.00	17.95
Sharon, Pa. S1	7.95	9.80	12.60	15.00	17.95
Trenton R4	.....	10.10	12.90	15.30	18.25
Wallingford W1	8.40	10.10	12.90	15.30	18.15
Warren, Ohio T4	7.95	9.80	12.60	15.00	17.95
Weirton, W. Va. W3	7.95	9.80	12.60	15.00	17.95
Worcester, Mass. A5	8.50	10.10	12.90	15.30	18.25
Youngstown C5	7.95	9.80	12.60	15.00	17.95

‡ On Application.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	34.88	40.85	33.21	.....
	2½	12	46.98	55.01	44.73	.....
	3	12	54.24	63.53	51.66	.....
	3½	11	63.32	74.16	60.30	.....
	4	10	84.09	98.47	80.07	.....
National Tube	2	13	34.88	40.85	33.21	.....
	2½	12	46.98	55.01	33.73	.....
	3	12	54.24	63.53	51.66	.....
	3½	11	63.32	74.16	60.30	.....
	4	10	84.09	98.47	80.07	.....
Pittsburgh Steel	2	13	34.88	40.85	.....	.....
	2½	12	46.98	55.01	.....	.....
	3	12	54.24	63.53	.....	.....
	3½	11	63.32	74.16	.....	.....
	4	10	84.09	98.47	.....	.....

(Effective Dec. 4, 1956)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.075	6.00	6.35				
So. Chicago *R3*				8.775			
Ensley *T2*	5.075	6.00					
Fairfield *T2*		6.00		8.775		6.025	
Gary *U1*	5.075	6.00				6.025	
Ind. Harbor *I3*	5.075		6.35	8.775		6.025	
Ind. Harbor *Y1*				8.775			
Johnstown *B3*		6.00					
Joliet *U1*	5.075		6.35				
Kansas City *S2*				8.775			
Lackawanna *B3*	5.075	6.00	6.35			6.025	
Lebanon *B3*							13.10
Minnequa *C6*	5.075	6.50	6.35	8.775		6.025	13.10
Pittsburgh *P5*				8.775	12.85		
Pittsburgh *J3*				8.775			13.10
Seattle *B2*				9.275		6.175	13.16
Steelton *B3*	5.075		6.35			6.025	13.10
Struthers *Y1*				8.775			
Torrance *C7*							
Williamsport *S5*		6.15					
Youngstown *R3*				8.775			

COKE

Furnace, beehive (f.o.b. oven) Net-Ton
Connellsville, Pa. ..... $15.25 to $15.75
Foundry, beehive (f.o.b. oven)
$18.00 to $19.00
Foundry, oven coke
Buffalo, del'd $30.75
Detroit, f.o.b. 29.50
New England, del'd 30.55
Seaboard, N. J., f.o.b. 28.75
Philadelphia, f.o.b. 28.50
Swedesland, Pa., f.o.b. 28.50
Painesville, Ohio, f.o.b. 29.50
Erie, Pa., f.o.b. 29.50
Cleveland, del'd 31.55
Cincinnati, del'd 28.59
St. Paul, f.o.b. 28.50
St. Louis, f.o.b. 30.50
Birmingham, f.o.b. 27.60
Milwaukee, f.o.b. 29.50
Lone Star, f.o.b. 25.50

ELECTRODES

Cents per lb f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	24.75	40	100, 110	10.70
20	72	24.00	35	110	10.70
16 to 18	72	24.50	30	110	10.85
14	72	25.00	24	72 to 84	11.25
12	72	25.50	20	90	11.00
10	60	26.50	17	72	11.40
10	48	27.00	14	72	11.85
7	60	26.75	12	60	12.95
6	60	30.00	10	60	13.00
4	40	33.25	8	60	13.30
3	40	35.25			
2½	30	37.25			
2	24	57.75			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper
Cast elliptical, 18 in. or longer, 5000 lb lots 57.42
Electrodeposited 45.28
Brass, 80-20, ball anodes, 2000 lb or more 58.00
Zinc, ball anodes, 2000 lb lots ... 21.25
(for elliptical add 2¢ per lb)
Nickel, 99 pct plus, rolled carbon... 90.50
(rolled depolarized add 3¢ per lb)
Cadmium $1.70
Tin, ball anodes and elliptical. $1.10 to $1.16

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum 80.50
Copper sulphate, 5 or more 100 lb bags, per cwt. 20.65
Nickel salts, single, 100 lb bags.... 38.25
Nickel chloride, freight allowed, 300 lb 43.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums 21.55
(Philadelphia price 21.80)
Zinc cyanide, 100 to 900 lb..... 55.55
Potassium cyanide, 100 lb drum N. Y. 48.00
Chromic acid, flake type, 1 to 20 100 lb drums 29.25

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts	Full Container Price	Pct Discounts 30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	55	58½	60½	61½
⅝" thru 1" x longer than 6"	46½	50	52½	54
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	55	58½	60½	61½
Lag, all diam. x 6" & shorter	55	58	60	61
Lag, all diam. longer than 6 in.	47	50	52	53
Plow bolts, ½" and smaller x 6" and shorter	54	57½	59	60

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full Case or Keg Price
¾ in. or smaller	63
⅞ in. to 1 in. inclusive	59½
1⅛ in. to 1½ in. inclusive.....	64
1⅝ in. and larger	58
C.P. Hex regular & hvy.	
¾ in. and smaller	63
⅞ in. to 1½ in. inclusive	59½
1⅝ in. and larger	58
Hot Galv. Nuts (All Types)	
¾" and smaller	50
Semi-finished Hex Nuts	
¾ in. and smaller	63
⅞ in. to 1½ in. inclusive	59½
1⅝ in. and larger	58
(Add 25 pct for broken case or keg quantities)	
Finished	
1" and smaller	65

Rivets

	Base per 100 lb
½ in. and larger	$10.85
	Pct Off List
7/16 in. and smaller	26½

Cap Screws

	Discount (Packages) *Bright Treated*	*H. C. Heat*
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	47	34
¾", ⅞" and 1" diam. x 6" and shorter	31	13
⅝" diam. and smaller x longer than 6"	18½	+ 1
¾", ⅞" and 1" diam. & longer than 6"	5½	+19½

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	47	63
¾" through 1" dia. x 6" and shorter	31	51½

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Quantity	Discount Mach. Screws	Stove Bolts
Cartons		19	32
Bulk			
To ¼" diam. incl.	25,000-200,000	9	54
5/16 to ½" diam. incl.	15,000-100,000	9	54
All diam. over 3" long	5,000-100,000	—	54

Machine Screw & Stove Bolt Nuts

	Quantity	Discount Hex	Square
In cartons		16	19
In Bulk			
⅜" diam. & smaller	15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	119.0
New York	131.4
Chicago	133.4
San Francisco-L. A.	140.2

Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick	*Carloads per* 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$128.00
No. 1 Ohio	128.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	20.00
Silica Brick	
Mt. Union, Pa., Ensley, Ala. $140.00	
Childs, Hays, Pa.	145.00
Chicago District	150.00
Western Utah 144.00-165.00	
California	170.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	150.00-157.00
Silica cement, net ton, bulk, Latrobe	26.50
Silica cement, net ton, bulk, Chicago	24.00
Silica cement, net tons, bulk, Ensley, Ala.	25.50
Silica cement, net ton, bulk, Mt. Union	23.00
Silica cement, net ton, bulk, Utah and Calif.	35.00
Chrome Brick	*Per net ton*
Standard chemically bonded, Balt..	$98.00
Standards chemically bonded, Curtiner, Calif.	108.00
Burned, Balt.	92.00
Magnesite Brick	
Standard, Baltimore $121.00	
Chemically bonded, Baltimore	109.00
Grain Magnesite St. ⅝ to ⅛-in. grains	
Domestic, f.o.b. Baltimore in bulk.	$69.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.	
in bulk	43.00
in sacks	49.00
Dead Burned Dolomite	*Per net ton*
F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio.....	$16.00
Midwest	16.35
Missouri Valley	15.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron f.o.b. Riverton, N. J., ocean bags	8.50¢
Canadian sponge iron, Del'd in East, carloads ...	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 5 to 10 micron, 98%, 99.8+% Fe	86.0¢ to $1.55
Aluminum freight allowed .	38.00¢
Brass, 10 ton lots .....37.50¢	to 50.00¢
Copper, electrolytic	59.50¢
Copper, reduced	59.50¢
Cadmium, 100-199 lb, 95¢ plus metal value	
Chromium, electrolytic 99.85% min. Fe .03 max. Del'd ..	$5.00
Lead .....8.90¢	plus metal value
Manganese	70.0¢
Molybdenum, 99% $3.35	to $3.85
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder power...7.0¢	to 9.0¢ plus met. value
Stainless steel, 302	99.0¢
Stainless steel, 316	$1.32
Tin .....14.00¢	plus metal value
Tungsten, 99% (65 mesh) ...	$4.20
Zinc, 10 ton lots .....18.75¢	to 32.50¢

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SAND OR SHELL MOLDED

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Three sizes. Keyways 1/16" up to 1".

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Lifts, pulls or lowers 6 tons or more when rigged with tackle blocks.

3300 LBS.

Ferroalloy Prices

(Effective Dec. 4, 1956)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C ...	41.50	0.20% C ...	38.50
0.03% C ...	41.00	0.50% C ...	38.25
0.06% C ...	39.50	1.00% C ...	37.50
0.10% C ...	39.00	1.50% C ...	37.35
0.15% C ...	38.75	2.00% C ...	37.25

4.00-4.50% C, 67.70% Cr, 1-2% Si.. 27.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.75
0.025% C (Simplex) 34.75
0.10% C, 50-52% Cr, 2% max Si.... 35.75
8.50% max. C, 50-55% Cr, 3-6% Si.. 24.00
8.50% C, 50-55% Cr, 3% max Si.... 24.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C.	$1.31
0.50% max. C	1.31
9 to 11% C, 33-91% Cr, 0.75% Fe..	1.40

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (⅝" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads	44.65
Ton lots	48.95
Less ton lots	51.45

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr. 20% Fe ¼ in. x 12 mesh.

Ton lots	20.15
Less ton lots	21.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr., 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed.....	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.75
Johnstown, Pa.	11.75
Sheridan, Pa.	11.75
Philo, Ohio	11.75
S. Duquesne	11.75

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:

Carloads, bulk	13.90
Ton lots packed	16.30

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$97.50
19 to 21%	3% max.	99.50
21 to 23%	3% max.	102.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.35

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	33.00
Ton lots	35.00
250 to 1999 lb	37.00
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn... 24.15

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	35.80	38.60	39.80
0.07% max. C	33.75	36.55	37.75
0.10% max. C	33.00	35.80	37.00
0.15% max. C	32.25	35.05	36.25
0.30% max. C	30.75	33.55	34.75
0.50% max. C	30.25	33.05	34.25
0.75% max. C, 80.85% Mn, 5.0-7.0% Si....	27.25	30.05	31.25

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b shipping point.

Carloads bulk	12.95
Ton lots	14.60
Briquet contract basis carloads, bulk, delivered, per lb of briquet.....	14.40
Ton lots, packed	16.80

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96.50% Si, 2% Fe ...	23.95	22.65
98% Si, 0.75% Fe	24.45	23.15

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 1 lb Si. briquets.

Carloads, bulk	7.55
Ton lots, packed	10.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si ...	13.50	75% Si ...	16.40
65% Si ...	15.25	85% Si ...	18.10
	90% Si. ...	19.50	

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots .	2.40	3.30	4.55

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Alsifer, 20% Al, 40% Si, 40% Fe.

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6%

f.o.b. Langeloth, Pa., per pound Contained Mo. $1.25

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Sb plus Ta..... $4.95

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.54

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.50
Less ton lots $1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y. freight allowed, carload, per net ton..... $215.00

Ferrotungsten, ¼ x down, packed, per pounds contained W, ton lots delivered $3.18

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. $1.33
bags, f.o.b. Washington, Pa. Langeloth, Pa. $1.30

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump.....	18.50¢
Ton lots, packed lump.....	20.50¢
Less ton lots.....	21.00¢

Vanadium oxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.33

Zirconium contract basis, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	37.35¢
12-15%, del'd lump, bulk-carloads	9.35¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload..... $5.50

Bortam, f.o.b. Niagara Falls
Ton lots, per pound..... 45¢
Less ton lots, per pound.... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed
Ton lots per pound..... 14.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots ... 1.20
F.o.b. Wash., Pa. Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% B 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese - Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
Ton lots $1.44
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots..... $2.05

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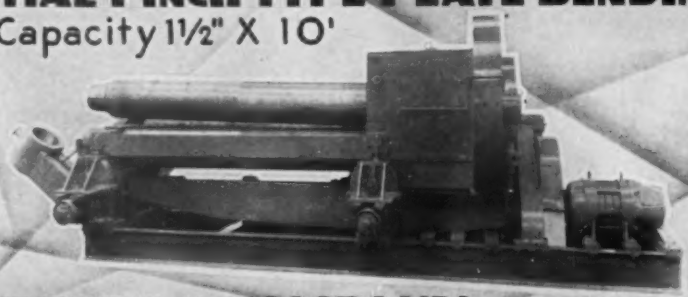
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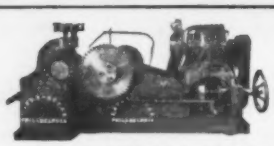
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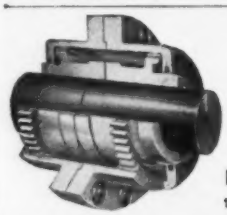
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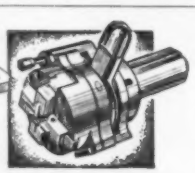
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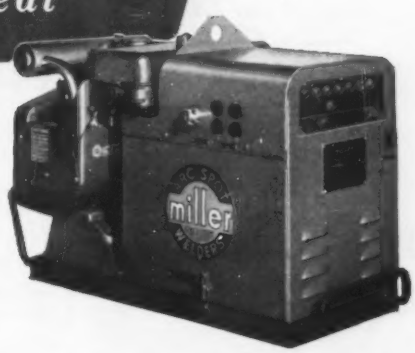
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THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Never Better . . . Dealers in the Detroit area are almost unanimous in the opinion that they never had it so good. No matter what kind of equipment is mentioned, they report its market is very good at the present time.

There isn't any one big reason for the present spurt, although some dealers are feeling the effects of a purchasing program delayed by the steel strike this summer.

Keeping Pace . . . At the same time, automotive vendors are beginning to realize that they must update some of their equipment to keep pace with the automakers.

Vendors hesitated this summer because of the steel strike and a slow 1956 market for cars. Now auto production, which was slow to start because of the many changes for 1957, is being upped and the suppliers have to keep pace or lose business.

Everything's Hot . . . Result is that there is hardly a piece of equipment in Detroit, whether it is tool room or production machinery, that is not a hot item.

In some cases, dealers are selling machines that they never even see. They buy it over the phone, sell it, and have it shipped to the customer. Biggest demand right now is for shears, press brakes, lathes and shapers.

From One to Another . . . Inventories of old machines, that is those from 1948 on, are good. It is hard to find newer equipment in stock because of the pressure put on from all sides. Any newer equipment that is on hand is there because it has parts missing which were used to fill another order.

The increased activity is also reflected from outside the area. As one dealer puts it, "We don't receive inquiries from outside the state anymore. We make a sale just about every time we get a call."

Calls are coming from as far away as Texas and California. Biggest push in these areas is for good presses and these are becoming increasingly harder to find.

Auto Sales a Factor . . . Few dealers admit that the Middle Eastern situation has anything to do with the present state of business, although some say that it could have touched off a wave of scare buying.

They feel that some customers are afraid of another Korea developing and may be getting their bids in early so as to avoid another situation similar to that which prevailed in 1950.

Nobody cares to make a prediction as to how long the boom will last. All predictions are qualified with such statements as "sales depend on the automotive market."

However, all are agreed that the fourth quarter this year will be one of the best the Detroit area has had in a long time.

Eastern Scarcity . . . Observers at New York hinted that unseasonally high used tool selling activity of third quarter would mean a real scarcity of equipment in the fourth quarter. This now seems proved, new inquiries are extremely strong and have been getting stronger over the past 30 days. This holds true for reconditioned equipment, "as-is" equipment, rebuilt equipment, and rental equipment. Smaller firms purchasing used tools have been forced to extend their payments and their number seems to be increasing, apparently due to a lack of loan capital in the area.

Slightly older tools that were particularly difficult for the smaller shops to move during 1955 are now receiving more attention from would-be consumers. This includes equipment 10 years or older, and some press equipment that goes back considerably further than 10 years.

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15 ton P&H	48' Span 230 Volt D.C.
15 ton P&H	72' Span 230 Volt D.C.
25 ton L-B Incl. 300 ft. Runway	75' Span 230/3/60 A.C.
80 ton Niles	72' Span 230 Volt D.C.
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1" to 5" Acme, Ajax, National
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44" Newbold Nine Rolls 4" Dia.
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72" McKay 17 Rolls 4¼" Dia.

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500 ton Elmes 18" Stroke Lower Platen 38" x 66"
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600 ton N-B-P 96" Between Strain Bars
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125 ton Beatty Open Back 1½" Stroke. Area of Bed 28½" x 26⅝"

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#10 Kling, 48" Throat, Punch 2" thru 1"
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80" x ¾" Pels Model STA-19
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#250 Kling, ¼" Capy.

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16' x ¼" Toledo

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1	1150	F.M.	OVZE, B.B.	4800	1800
1	1000	A.C.	Mill	2300	240
1	800	G.E.	MT	2300	298
1	750	G.E.	MT-573	2200	1190
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	400	Whse.	CW-960A	440	1170
1	400	Whse.	CW	440	514
1	400	Whse.	CW-1313	2200	455
1	350	G.E.	IM-17A	440/2300	720
1	250	G.E.	MT-424T	4800	257
1	250	G.E.	MT-559B	2200	1800
1	250	Al. Ch.		550	600
1	200	Cr. Wh.	20QB	440	505
1	200	G.E.	IM	440	435
1	200	G.E.	IM	2300	580
1	150 (unused)	Whse	CW	2300	435
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1	125	Al. Ch.		440	720
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4	100	A.C.	ASY	440	695

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1	800	G.E.	KT-573	2200	1180
2	650	G.E.	FT-559BY	440	3570
2	450	Whse.	CS-1420	2300/4150	354
1	400	G.E.	IK	2200	500
1	200	G.E.	IK-17	440	580
3	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440	900/450
1	150	Whse.	CS856B	440	880
1	150	Whse.	CS	440	580
2	125	Al. Ch.	ARW	2200	1750

SYNCHRONOUS

Qu.	H.P.	Make	Type	Volts	RPM
1	7000	G.E.	ATI	2200/6600	600
1	4350	C.W.	3501BL4000/4900/13800		514
1	2850	Whse.	.8 p.f.	2300/4600	514
1	2800	Whse.	.8 p.f.	2300	720
2	2000	Whse.		2300	120
2	1750	G.E.	ATI	2300	3600
1	735	G.E.	ATI	2200/12000	600
1	500	G.E.	TS-7567	2200	1200
1	450	Whse.		2200	128.5
1	325	G.E.	ATI	440	1800
1	225	G.E.	ATI	440	1800

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GRINDING MACHINES
No. 5 Abrasive 12" x 60" surface grinder.
72" Hanchett 3-spd. rotary surface, new 1948.
14" x 36" Pratt & Whitney hyd. vert. surface, 1942.
No. 74 Heald hyd. pl. internal, X-sliding H. S., 1941.
18" x 36" Landis type C hyd. pl. cylindrical, 1942.
6" x 30" Cincinnati EA Filmatic pl. cylindrical, 1942.

HAMMERS
No. 3C Chambersburg pneumatic, serial No. 2297.
No. 6-1 Nazel, pneumatic, late.
No. 6B Nazel, self-contained.

LATHES
No. 3 Gisholt Univ. Turret Lathes (2), 1942.
No. 5 Gisholt ram type Univ. Turret Lathe, 1940.
14" x 6' Hendey Toolroom, 1940.
15" x 30" Lipe Carbo-Matic, 1942.
36" and 42" Bullard New Era vertical turret lathes.
120" x 96" CC Niles Cement Pond engine lathe, 80 HP, M.D.

MILLING MACHINES
No. 2 Brown & Sharpe vertical mill, new 1943.
No. 4 Cincinnati high power plain horizontal mill, serial E 506 J.
No. 5-48 Cincinnati hydromatic duplex mill, serial 3B5IDIK-5.
No. 2-24 Cincinnati automatic simplex mill, serial No. 1B3PIT-1.

PRESSES
90 ton No. 92½C Toledo D.C. Str. Side.
200 ton No. 7-72 Bliss S.S. D.C. Press, Air Clutch.
260 ton No. 795½-72 Toledo D.C., Toggle drawing.
350 ton Elmes self-cont. 4-post Hydraulic Press, 1944.
500 ton No. 1039 Hamilton D.C. adj. hed. 60"x102".
2000 ton No. 6 National Maxipress Forging Press.

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24" Gould & Eberhardt Universal.
32" G & E Invincible, F.M.D.
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No. 64SA3 Fellows, vee belt drive
No. 72 Fellows High Speed Spur Gear Shaper, m.d.
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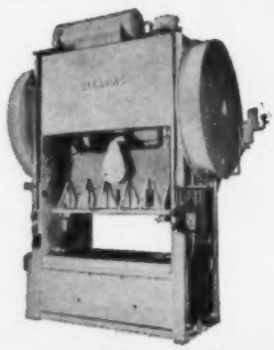
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Constant Duty 3 Phase 60 Cycle

Qu.	H.P.	R.P.M.	Make	Type	Volt
1	100	430	Al. Ch.		220/440
2	100	495	G.E.	IM-15A	2300
1	100	570	G.E.	MT-543	220/440
1	100	870	Whse.	CW	220/440
1	100	900	El. Dy.	EDX612	2300
1	100	1180	Whse.	CW	220/440
1	150	435	Whse.	CW1000	220/440
1	150	490	Whse.	CW	220/440
1	150	585	Whse.	CW	4160/2300
1	150	705	Al. Ch.	ANY	220/440
1	200	490	G.E.	IM-14	2300
2	200	585	G.E.	IM-16	2200
1	200	1760	G.E.	IM-13B	2300
1	250	300	G.E.	MT-414	2300
1	250	705	Al. Ch.	ANY	220/440
1	350	450	G.E.	MT-412	2200
1	400	290	Whse.	CW	2200
1	400	505	Al. Ch.	ANY	2200
2	450	440	Whse.	CW	2200
1	500	450	G.E.	IM	2300
2	500	505	Al. Ch.	ANY	2300
1	700	295	Whse.	CW	2800
1	750	400	G.E.	IM	2300
1	1000	445	Whse.	CW	2300
1	1500	360	G.E.	Mill type	2300
1	1800	270	Whse.	Mill type	6600/4000
2	2500	257	G.E.	Mill type	2300

SYNCHRONOUS MOTORS
3 phase—60 cycle

Qu.	H.P.	R.P.M.	Make	Type	Volt
1	2500	720	Whse.	.8 PF	2200/4160
1	2000	900	Whse.	.8 PF	2200
1	1500	514	Whse.	.8 PF	2300
1	1000	1200	El. Mchy.	.8 PF	440
1	1000	900	G.E.	.8 PF	2300
1	710	720	G.E.	.8 PF	440/2300
1	450	1200	Whse.	1.0 PF	2200
1	300	720	G.E.	TS 982	440/2300
1	300	600	G.E.	TS 7656	2200
2	280	900	Cr. Wh.	.8 PF	2300
1	250	600	Whse.	.8 PF	220/440
1	200	514	Al. Ch.	1.0 PF	2300
1	200	450	G.E.	.8 PF	440
1	200	360	Al. Ch.	1.0 PF	440/2300/4
1	150	900	G.E.	ATI	2200
1	150	720	El. Mchy.	.8 PF	220/440
1	150	600	G.E.	TS 7841	550
3	135	900	G.E.	TS 963	4000/2300
1	125	900	El. Mchy.	1.0 PF	4800/2400
1	125	900	G.E.	TS 7556	2200
2	100	1800	Whse.	.8 PF	220/440
1	100	900	Ideal	.8 PF	220/440
2	100	600	G.E.	TS 7641	220/440
1	100	360	El. Mchy.	1.0 PF	220/440

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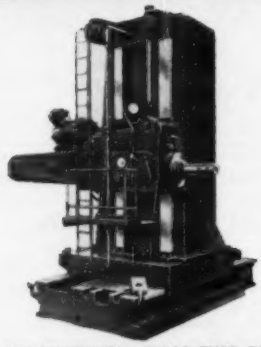
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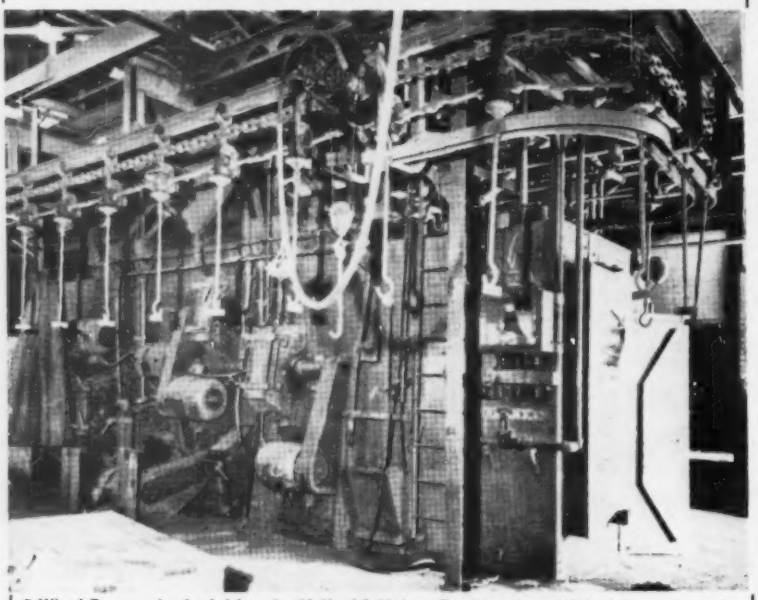
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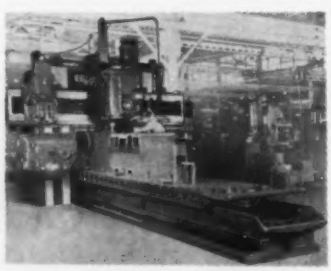
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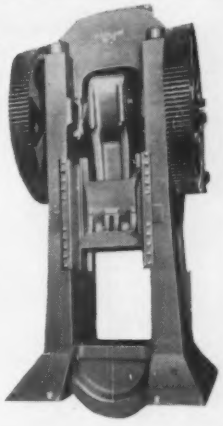
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Net Factory Wages Hit New High

After deducting Federal income and social security taxes, the average pay of factory workers without dependents was $67.46 and that of workers with three dependents was $74.87, the U. S. Dept. of Labor reports. It's an all-time high. These amounts represent an increase of 50 cents over the month and about $2.80 over a year ago.

Consumer Prices Smash Record

A sharp rise in prices for 1957 automobiles was the principal factor in a 0.5 pct increase in the Consumer Price Index between September and October 1956, according to the Bureau of Labor Statistics. The Index for October was at a record level of 117.7, and 2.4 pct higher than a year ago.

New Dominion Blast Furnace Fired

Dominion Foundries & Steel Ltd., Hamilton, Ont., blew in its new $9 million blast furnace Nov. 30, to bring its rated pig iron capacity from 1000 to 2000 tons a day. The new furnace was under construction for 10 months and is part of the company's $88 million expansion program.

Titanium Body For GM Test Car

An all-titanium automobile body, the first ever fabricated, is being used by General Motors Corp. on its experimental car, Firebird II. Wide titanium sheets were supplied by Republic Steel Corp. The metal's two outstanding characteristics, light weight and corrosion resistance, offered an irresistible challenge to GM designers.

CDA Presses For Federal Air Raid Shelters

Federal Civil Defense Administration officials, wary of increasing international tension, are again pushing for a multi-million dollar start on air raid shelter construction. The program would cost between $15 and $35 billion to provide a million H-bomb shelters. If Congress goes along, the program would add new demands on the already tight construction materials market.

ICC Gets The Nod Over Carriers

A Supreme Court ruling has affirmed the Interstate Commerce Commission's authority to pass judgment on the claims of carriers seeking higher payments for government shipments. The ruling is estimated to have saved the U. S. at least $20 million.

Three Vice Prexy's Named By GM

General Motors Corp. named three new vice presidents. They are James M. Roche, vice president and general manager of Cadillac Div.; Louis G. Seaton, vice president in charge of personnel staff; Anthony G. DeLorenzo, vice president in charge of public relations.

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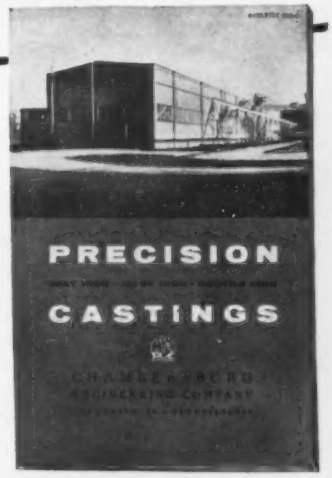
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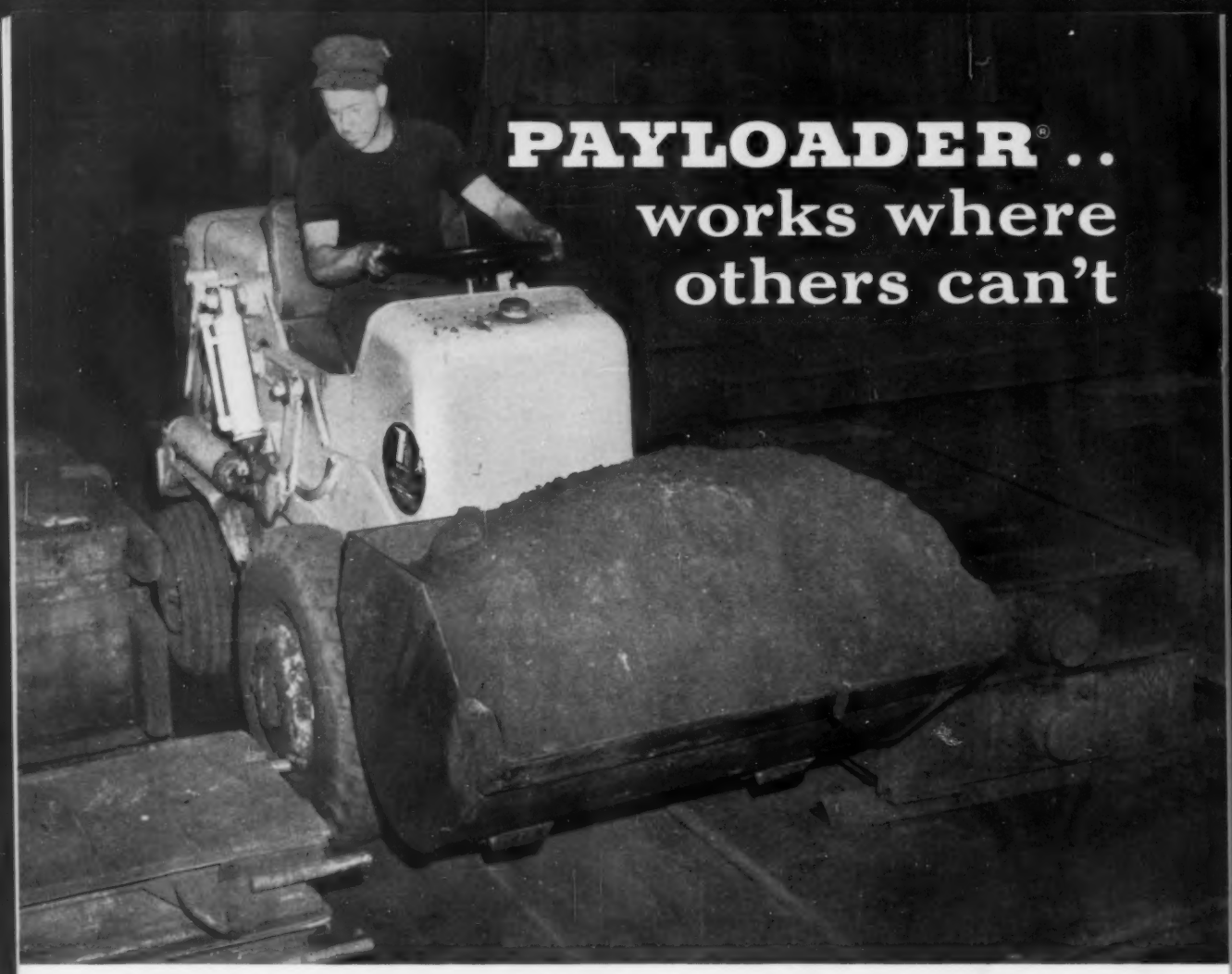


MACLEOD *Custom-Built*
BLAST CLEANING ROOMS

MACLEOD offers complete designing, fabrication, and installation of abrasive blast cleaning rooms, abrasive reclaiming systems, blast generators, and dust collecting systems—designed to meet your specific needs.

The room installation illustrated was custom-built by MACLEOD for the renovation of various types of military vehicles. It is served by a continuous, automatic blast generator, abrasive reclaiming and cleaning system, and a dust collecting system with a 54,000 cu. ft. per minute capacity. The floor is stressed to support vehicles up to 45 tons. Write for descriptive literature on MACLEOD Blast Cleaning Rooms, Cabinets and Machines.

The MACLEOD Company
BOX 457, SHARONVILLE, OHIO ESTABLISHED 1897



What makes a PAYLOADER® best for your jobs?

Shortest turning radius
Highest dumping height
Biggest bucket (18 cu. ft. Payload)
Hydraulic-load-shock-absorber
40° bucket tip-back at ground level
Exclusive, one-lever bucket control

Many foundry and metal-working customers tell us that a big advantage of the model HA "PAYLOADER" for their operations is its ability to travel and work where others can't — to negotiate narrow aisles, boxcar doors and corners. Yet this "PAYLOADER" boasts a bigger bucket (18 cu. ft. payload) and can get more, carry more and deliver more tonnage than any tractor-shovel anywhere near its size. An extra plus for any model HA owner is the number of attachments that are available to handle extra jobs — sweeper, fork lift, pusher fork, snow plow.

Owners *expect* more from a "PAYLOADER" and they *get* more because more "PAYLOADER" tractor-shovels have been built and are in service than all other wheeled tractor-shovels put together. There's a "PAYLOADER" size and type to fit *your* needs and a nearby Distributor ready to serve you right.

THE FRANK G. HOUGH CO.
733 SUNNYSIDE AVE., LIBERTYVILLE, ILL.

Send data on "PAYLOADER" tractor-shovels

- ☐ HA (18 cu. ft.) and HAH (1 cu. yd.)
- ☐ Larger models to 2¼ cu. yd.

Name _____

Title _____

Company _____

Street _____

City _____

State _____

10

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



Before starting up in the fall of 1936, this rolling mill was equipped with a Trabon Centralized Lubrication System, shown in red.

Each bearing has received measured amounts of grease at the correct time, day in and day out, for these twenty years. Because lubrication has been automatically performed by a Centralized Trabon System, bearing failure has been virtually non-existent.

How is your equipment lubricated? Only a Trabon System can bring you all these advantages:

1 **Save dollars. The number of man hours saved in a few months will pay for a Trabon System.**

2 **Reduce down time. A Trabon System lubricates while the machine is running with no hazard to the operator.**

3 **Positive check on lubrication. A Trabon System automatically indicates any stoppage of lubrication and provides a simple method of tracing the trouble.**

4 **Extend machine life. A Trabon System lubricates every point correctly, eliminating burned out bearings due to improper lubrication.**



In the Trabon line of oil and grease systems you will find a system that exactly suits your equipment. May we send you some literature on the subject?

Trabon "Centralized" OIL AND GREASE SYSTEMS
"Meterflo" CIRCULATING OIL SYSTEMS

Trabon ENGINEERING CORPORATION
1814 E. 40th STREET • CLEVELAND 3, OHIO
Oil and Grease Systems

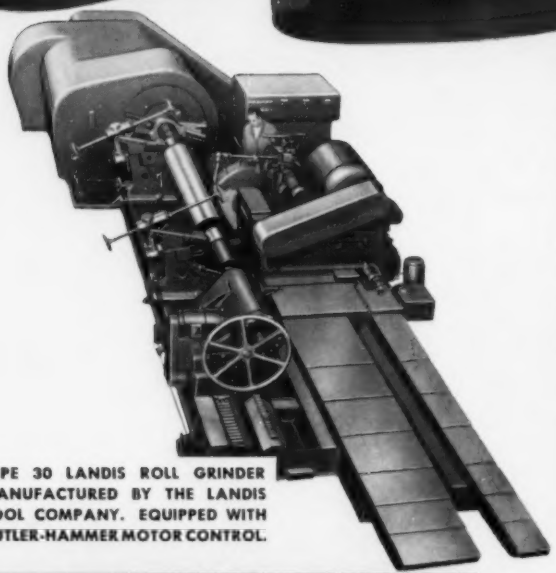
CUTLER-HAMMER

MOTOR CONTROL

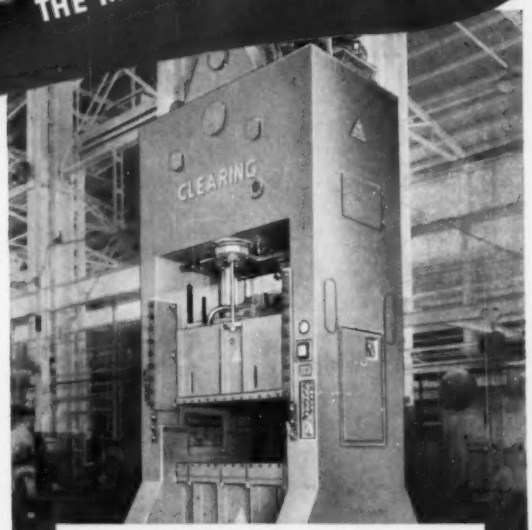
C-H

CHOICE OF THE LEADERS

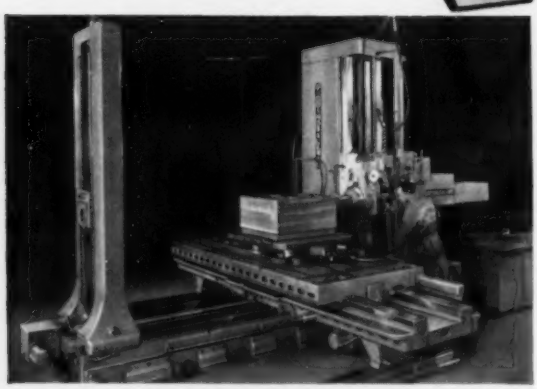
THE MARK OF BETTER MACHINES



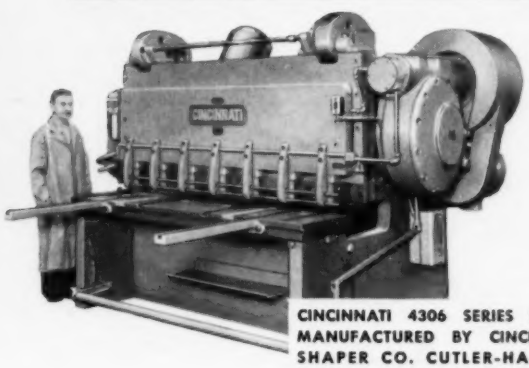
TYPE 30 LANDIS ROLL GRINDER MANUFACTURED BY THE LANDIS TOOL COMPANY. EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



STAMPING, BLANKING AND DRAWING PRESS MADE BY THE CLEARING MACHINE CORP., DIVISION OF U. S. INDUSTRIES INC. THIS CLEARING TYPE F PRESS IS EQUIPPED WITH CUTLER-HAMMER THREE-STAR MOTOR CONTROL AND HEAVY DUTY OIL-TIGHT PUSHBUTTONS.



THE GIDDINGS & LEWIS 30 SERIES TABLE TYPE HORIZONTAL BORING, DRILLING AND MILLING MACHINE USES CUTLER-HAMMER THREE-STAR MOTOR CONTROL AND HEAVY DUTY OIL-TIGHT PUSHBUTTONS.



CINCINNATI 4306 SERIES SHEAR MANUFACTURED BY CINCINNATI SHAPER CO. CUTLER-HAMMER MOTOR CONTROL IS FURNISHED AS ORIGINAL EQUIPMENT.

"That Something Extra"

Everyone knows, "It's that something *extra* that makes the leader." This is particularly true when you refer to the leaders among machinery builders. Leading machinery builders *must* have "that something extra" to command the respect and preference of experienced buyers. Compare any leader's machines with others and "that something extra" shows clearly in one or more ways . . . finer workmanship, greater precision, more dependable performance, new and better methods and equipment for operation and control. In recent years, more and more leaders proudly feature Cutler-Hammer Three-Star Motor Control and Heavy Duty Oil-Tight Pushbuttons. Such a marked trend could only result from careful comparison that proved a definite superiority. When you buy machines, you too will find Cutler-Hammer control equipment a reliable guide to satisfaction. Now, more than ever before, Cutler-Hammer Motor Control is the choice of the leaders . . . the mark of better machines. CUTLER-HAMMER, Inc., 1325 St. Paul Avenue, Milwaukee 1, Wisconsin. Associate: Canadian Cutler-Hammer, Ltd., Toronto, Ontario.